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EDITORIALS

THANK YOU . . . Many comments regarding the initial issue of AMERICAN ANTIQUITY, complimentary and constructively critical, have come to the Editor's desk. For these, and for the spirit which prompted the senders, the staff is sincerely grateful. We probably realize as fully as you do the shortcomings of that issue, and it is our earnest purpose to progressively minimize those faults as our growing experience and your growing coöperation permit. We are pleased that in general you approve of the journal and its form, and that you appreciate some of our early, immature attempts to insure its interest and value to you.

STUDENTS AND COLLECTORS . . . Unfortunately, there is a classification that divides those who rise to the name "archaeologist" into two distinct and separate groups: students and collectors. I believe that such a classification is fundamentally wrong. All archaeological students, if not themselves collectors, study the collections of others, since collections that are properly made and catalogued are storehouses of facts pertinent to scientific problems. And all collectors are potential students, since fact-revealing materials that pass through their hands may at any time engage their interest in some related problem.

It is true that many collectors of "relics" are in no sense students of archaeology, since their interests are limited to the possessing of beautiful or odd "rocks," pots or other souvenir materials. The archaeologist's interests are essentially historical; materials in collections, whether beautiful or unattractive, peculiar or characteristic, perfect or fragmentary, excite his interest primarily to the extent that they reflect human customs and activities. Fortunately for the progress of archaeology, however, man is normally possessed of curiosity which, inducing one to seek an answer to some question rising from material traits or associations, leads to research.

With research the first step towards becoming a student of archaeology has been taken. However, the all-important second step, which has to do with method, is not infrequently omitted by the amateur student. Unmethodical excavations have resulted in the permanent destruction of vast quantities of valuable information in the American archaeological field. This wholesale miscarriage of good intentions on the part of amateurs continues year after year. Research can only produce desirable results if correct technical methods are employed. Even in instances when research does not involve excavation, sincerely interested but untrained students have labored long and in vain, their well-intended efforts serving to confuse issues and distort answers rather than to clarify and solve problems.

Axiomatically, the untrained student needs training. How can this essential training be made available to him? The accumulated research and experience, through several generations, of students of anthropology, of which archaeology is but an artificially separated subdivision, have resulted in the formulating of improved (continuously improving, we hope) field and laboratory technical methods. The student may acquire a knowledge of these, and should when possible, through channels afforded at those universities where anthropology is taught as a major subject.

However, all sciences, and archaeology can be no exception in this, have profited and continue to profit from contributions of students whose training has been acquired through privately conducted studies. Anyone who can read, is sufficiently interested to apply himself, and has access to qualified sources of information, can equip himself in ever increasing degree to take an accepted place in the ranks of archaeological students. As in the case of any science, certain types of highly technical work are best undertaken or directed by specialists, which leaves a broadly adequate variety of research tasks for the amateur.

Unquestionably, the activities of amateurs, when motivated by the purpose to find the truth at any price, and when conducted with studious care and according to methods which insure accurate and complete data, can be of inestimable value to the professional student. In fact, it is difficult to see how the work of the specialist can progress satisfactorily, if indeed it can survive, without the support of a constantly growing element of amateur students.

AMERICAN ANTIQUITY, acting as the instrument of the Society for American Archaeology, hopes that it may serve to some extent in providing the means of a mutually beneficial contact between professional and amateur students of American archaeology.

DO YOU ALWAYS AGREE? . . . Each year, students of American archaeology meet here and there, by twos or by scores, and discuss mutual problems and conflicting theories and ideas with an unrestricted exercise of the right to individual freedom of opinion. Again and again you and I have heard at these sessions interesting and profitable controversies.

Your Editor believes that science flourishes, flowers and progresses to a productive fruitfulness in such an atmosphere of critical controversy. There is a section in this journal reserved for "Correspondence." What better outlet could there be for one's controversial opinions? We hope that our readers take full advantage of it.

BURIAL CUSTOMS IN THE DELMARVA PENINSULA[2] AND THE QUESTION OF THEIR CHRONOLOGY

D. S. Davidson

AS IS WELL known, one of the most serious handicaps to archaeology along the Atlantic Seaboard is the scarcity of deep stratified sites. Shallow sites are numerous, but if these ever contained superimposed cultures, the evidence in most cases seems to have been destroyed by the plow. Furthermore, as the result of an intense population, the most likely Indian sites are now covered by cities, towns and farms. These factors coupled with a humid climate, so destructive to all but non-perishable artifacts, have combined to present us with most difficult problems.

It must not be supposed that the case is hopeless, but it is obvious that unless some unforeseen good fortune should bring to light exceptional sites, progress toward the eventual understanding of the chronological aspects of the archaeology of the region will be made only through a most laborious process. With this probability facing us, it is necessary to take cognizance of every shred of evidence, no matter how insignificant it may appear, with the hope that in time it can be correlated with other data and eventually contribute to a more complete story.

As the result of the historical accounts left us by early writers and a few facts from excavation, it now seems possible to suggest tentatively the chronology of certain burial practices in the Delmarva Peninsula, a region which has been almost completely neglected by archaeologists.

I

The historical method of treating the dead along the eastern littoral from southern Pennsylvania southward was that of bone-scraping with final interment of the remains in ossuaries. These practices seem to have varied somewhat from locality to locality, if we can judge from the ambiguous or incomplete statements left us in historical records, so that it will be only through archaeology that the boundaries of some of them can be defined.

The customs of the Nanticoke tribe of Delaware and the eastern shore of Maryland are known to have been similar in part to those of

[2] The state of Delaware and the eastern shore of Maryland and Virginia.

1.—Partially disarticulated skeleton. Apparently a "cleaned-bone" burial.

2.—Upright flexed burial covered by a refuse pit. Top of skull, injured by workman, removed.

3.—Three skeletons in a nested burial.

TYPES OF BURIAL AT SLAUGHTER CREEK, DELAWARE

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their Virginian neighbors, but the reports available indicate that there were important differences. For many detailed points there is no information, for since the early writers commented on ethnology only in passing, it is impossible to determine whether the report that a trait was present in one tribe is or is not an indication of its presence among certain others of these closely related local cultures.

In Virginia[4] the practices consisted of mummification of the bodies of "chiefs," whoever this term may include, whereby, following disembowelment, the skin was slit up the back and removed, the flesh cut from the bones by priest-officials and dried, and the skin replaced and packed with sand to enclose the skeleton sometimes wrapped in skins and *still articulated* by the uncut ligaments. The remains, finally wrapped in fine, white, dressed skins and rolled in mats, were then laid away in a mortuary temple beside the mummies of the previously deceased. The dried flesh and the riches of each were placed at the feet or nearby. Eventually the remains were disposed of in burial ossuaries. The common people, apparently without any preparation of the body, are said to have been buried in graves about three feet deep. The orientation is not given, but the modern Chickahominy, according to oral testimony collected by the writer, bury with the head to the south or southeast.

For the Conoy of Maryland and the Accomac and Accohannoc tribes of the Delmarva Peninsula there seem to be no direct accounts of treatment of the dead, but there can be little doubt but that their practices were somewhat similar in view of their close cultural relationship with the Powhatan groups on the one hand and the Nanticoke tribe on the other.

The general features of the Nanticoke mortuary practices, as rereported historically for the 17th and 18th centuries, included bone-scraping, although it is not certain that the Nanticoke priests scraped

[4] We have the accounts of such early writers as Hariot (1585), Smith (1608), Strachey (1612), Beverly (1702), and Lawson (1709). This material has been summarized by a number of writers so that it is unnecessary to repeat the detailed references here. See Willoughby, C. C., The Virginia Indians of the Seventeenth Century, American Anthropologist, Vol. 9, 1907, p. 62; Speck, F. G., The Ethnic Position of the Southeastern Algonkian, ibid., Vol. 26, 1924, p. 191; MacLeod, W. C., Priests, Temples and the Practice of Mummification in Southeastern North America, International Congress of Americanists, 22nd Session, Rome, 1926 (1928), pp. 207–230; Bushnell, D. S., Jr., Native Cemeteries and Forms of Burial East of the Mississippi, Bulletin 71, Bureau of American Ethnology, 1920.

the bones,[5] mummification of chiefs,[6] temples for the mummies, and burial ossuaries, probably much the same as in Virginia. It would appear, however, that bone-cleaning and final disposal in ossuaries were not restricted to chiefs by the Nanticokes as those customs appear to have been in Virginia. In a large Nanticoke ossuary on the Choptank River, eastern-shore Maryland, apparently late 17th century, the remains of over one hundred individuals, including many females, were excavated by Mercer.[7] Certainly a great number of these, and possibly all in one pit, had been thrown into the ossuary at one time, and it seems certain that the local group in this area could not have accumulated the remains of so many "nobles," including women, except over a considerable period of time. Since the ossuary seems to have been filled within a short time, it appears that the bones of commoners must have been included.

There can be no doubt that the bones had been cleaned. There was not a semblance of an articulated skeleton in the lot and, except for a few collections of the various long bones in piles, the remains seem to have been strewn indiscriminately throughout the ossuary. The lowest bones were well burned as if thrown into a fire. Those in the middle layer were somewhat charred, but the topmost were unscorched.

The scattered distribution of the bones suggests that these individuals had *not* been mummified, at least in the Virginian manner, unless we are to assume that the "mummies" were subsequently dismem-

[5] Speck, F. G., The Indians of the Eastern Shore of Maryland, the Eastern Shore Society of Baltimore City, Baltimore, 1922, p. 13, speaks of professional priest bone-scrapers for the Nanticoke but has informed me that the statement was based upon the analogy between the general customs of the Nanticoke and Powhatan groups. MacLeod, op. cit., p. 209, is of the opinion that this trait was lacking among the Nanticokes.

[6] We infer that members of royalty were treated in this manner. For instance, in 1686 the Nanticokes at Assateague protested to the authorities that settlers had vandalized the "tombs" of some of their former kings and had stolen quantities of "roanoke and skins." In Dorsetshire, Maryland, the "body" of the last local chieftain, who died between 1712 and 1717, was preserved in a temple until 1780. (Cited by MacLeod, p. 209.)

[7] Mercer, H. C., Exploration of an Indian Ossuary on the Choptank River, Dorchester County, Maryland, in Researches upon the Antiquity of Man, Publications of the University of Pennsylvania in Philology, Literature and Archaeology, vol. VI, 1897. The site is a late historic one occupied by the Nanticoke until 1722, at which time the district was sold by the Indians to Europeans. The ossuaries, according to Mercer, were apparently filled before the site was occupied as a village and for that reason he was inclined to consider them as of late 17th century. The cephalic indices of 32 skulls varied between 71.9 and 78.5 for males and between 72.1 and 77.7 for females. (Cope, E.D., in Mercer, op. cit.)

bered.[8] Rather it appears that their bones had been cleaned and completely disarticulated. Subsequently, in some cases, the bones of several individuals, it would seem, were brought together, partially classified in piles, and the remainder gathered together without distinction. It may be that the mummified remains of the Nanticoke "chiefs," if articulated in the Virginian manner, were not placed in the same ossuaries as commoners. We have no skeletal material known to be the remains of chiefs.

There are also historical accounts which show that the Nanticokes practiced general bone-cleaning for the rank and file of the tribe, during the 18th century in Pennsylvania[9] and during the 19th century in Kansas.[10] Although the tribal exodus from Delaware and Maryland,

[8] As has been stated, the skeletons of the "chiefs" in the latter area were not only left articulated, as the result of not cutting the ligatures when the flesh was scraped off, but the skin was replaced and packed with sand which would tend to maintain the normal position of the bones. Lastly the "mummy" was wrapped in skins and mats. In spite of the possibility that there might be some disarticulations as the result of carrying the "mummy" to the temple and subsequently in transporting it to the ossuary, it would seem that the bones of each skeleton should lie close to one another in the ossuary unless the wrappings had been removed and the bones tossed singly into the pit.

[9] When the tribe finally capitulated to the Whites and started to move slowly north through the Susquehanna Valley of Pennsylvania toward their eventual domicile with the Iroquois, they are reported not only to have carried the fleshless and malodorous bones of their relatives with them, but also to have returned to their old homeland to fetch the skeletal remains of others. Heckewelder, so often quoted, seems to have been much impressed by the "disagreeable stench" which trailed the groups who carried these remains through the town of Bethlehem between 1750 and 1760. Reburial was made in many ossuaries at the various temporary Nanticoke towns along the Susquehanna.

[10] Further evidence of bone cleaning without mummification was secured recently by Speck, F. G., Delaware Ceremonies, Feasts and Dances. Manuscript, in text material from Delawares with whom some Nanticokes were domiciled in the Kaw River region of Kansas prior to 1875. According to the statements, the Nanticokes placed a body upon a platform about as high as a person where it was left until the flesh decayed and fell from the bones. The putrid flesh was gathered and buried in front of the platform, but the bones were not removed until the Ghost Dance was held. At that time, the bones of apparently all who had died since the previous Ghost Dance were prepared for the ceremony.

A post for each of the dead was erected and to it was tied a crosspiece. Each skull was placed upon its post, and the post and crossarm dressed appropriate to the sex of the deceased. The remaining bones were then laid opposite each post.

During the dance which followed, the participants circled the posts in a counterclockwise direction. We are not informed of the eventual disposal of the skulls and the other bones. Most likely they were buried. It is important to note that members of both sexes were treated similarly and presumably that the bodies of children were also included in these ceremonies.

and the degenerating influences resulting from loss of lands, defeat by the Europeans and the failure of their own institutions, were catastrophic in magnitude and engendered actions which must have differed from traditional practices, it nevertheless seems plausible to suspect that many of the customs observed among the Nanticokes outside of their homeland were continuations of earlier practices, especially when they seem to confirm customs suggested by archaeological evidence.

These archaeological and historical references, therefore, would seem to imply that the Nanticokes of the early historic and probably the late pre-colonial period for the population at large, excepting chiefs, practiced bone-cleaning, complete disarticulation of the skeleton, and wholesale burial in ossuaries without mummification.

Supporting indirect evidence for this contention is available in the accounts of the practices of the southern Delawares, the Wolf Clan, who inhabited the region just north of the Nanticokes and who claim that their bone-cleaning rites were derived from the Nanticokes.[11] In this tradition they are substantiated by the northern Lenape among whom bone-cleaning is lacking.

According to Lindstrom, the Lenape in the Chester region in 1654 buried their dead in a sitting posture on a "stool." The wealth of the deceased was placed on the body, and in his mouth was inserted a tobacco pipe, said to have been a fathom long![12] After the body was covered, four poles were set upright around the grave and three shelves attached to them.

About a month after burial the body was exhumed and the various objects of wealth placed upon the lowest shelf. Apparently "each one" present, that is, each living person, thereupon took a knife and proceeded to cut the flesh from the bones.[13] Once removed, the flesh was wrapped in chestnut bark and placed upon the second shelf, but the entrails were disposed of by burial. The cleaned bones were the last to receive attention and were wrapped, likewise in chestnut bark, and put upon the third or topmost shelf. Following fourteen days of exposure, the wealth on the bottom shelf was distributed among the

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[11] It is interesting to note that the Six Nations refer to the Nanticokes as the "Wolf Clan." Speck, F. G., Nanticoke and Conoy, p. 22.

[12] Lindstrom, Geographicae Americanae, 1654 (translated by Amandas Johnson, 1926); see MacLeod, p. 208.

[13] The meaning of "each one" is questionable, but is interpreted by MacLeod as an indication that the Lenape apparently like the Nanticokes did not have professional flesh-strippers as did the Virginian tribes.

relatives and friends of the deceased, but the remains of flesh and bones and the poles and shelves were abandoned and left to the elements.

It would thus appear that at the middle of the 17th century, although the southern Delawares practiced bone-cleaning, they may have not reburied in ossuaries. However, we cannot be certain from Lindstrom's account that the bones were not subsequently collected and deposited in single graves, if not in ossuaries.

Some changes are to be noted for the Lenape practices as reported for the 19th century. At this time initial burial is not mentioned and may have been no longer practiced. As described by Adams,[14] when a member of the Wolf Clan died, the flesh was scraped from the bones and buried and the bones allowed to dry for twelve days. At the end of this period the skeleton was wrapped in white buckskin and carried to the place where the Human Skeleton Dance was held. Here the bones in their casement or bundle were rattled by shaking while the dancers circled around. Following this ceremony the skeleton was buried, but where, how and in what fashion we are not told. There are no indications of mummification. Presumably the skeleton was disarticulated and the bones gathered into a bundle. We are also given the impression that the bodies of all members of the Wolf Clan received this treatment, as apparently true among the Nanticokes of the 18th and 19th centuries. This custom was not discarded entirely until just before the Civil War. Although the account does not reveal the final disposition of the bones, it seems likely that they were buried. At least it should be possible to check this point by means of archaeological investigations.

II

It has been generally believed by all recent writers who have given the subject their attention that bone-cleaning and the traits associated with it are of southern derivation as claimed locally by the Delawares, and that they had diffused northward into Virginia, Maryland, Delaware and southern Pennsylvania. For this general northern area, as we have seen, the rites appear to have been strongly institutionalized among the Virginians and somewhat less so for the Nanticokes, but to have appeared in only a rudimentary form among the southern Dela-

[14] Adams, R. C., 1890, Notes on Delaware Indians, In the report on Indians Taxed and Not Taxed, United States Census, p. 299; cited by Harrington, M. R., 1921, Religion and Ceremonies of the Lenape Indian, Notes and Monographs, Museum of the American Indian (Heye Foundation), pp. 183–184.

wares. Although it seems permissible to speak of these practices as constituting a complex, it is nevertheless clear that they were not indissolubly bound together. At least, it is apparent that bone-cleaning could detach itself and diffuse alone, as it seems to have done in respect to the southern Delawares. However, bone-cleaning is the basic trait upon which the others, cleaning by priests, mummification of the described types, temples for the mummies, and ossuaries, are hypothecated. Whether these others eventually would have followed bone-cleaning to the Delawares cannot be stated, but they do not seem to have done so over a period of two hundred years, although it should be pointed out that during this period European influences predominated and entirely disrupted native culture.

If bone-cleaning was of recent arrival among the Delawares, as appears probable in view of its restricted appearance in this tribe, it also seems likely that its practice among the Nanticokes may not have been of long duration before the Europeans arrived. However, regardless of its antiquity in this region, it is obvious that it must have replaced or have been combined with the methods of treating the dead previously in vogue. It would appear, therefore, that if by archaeological research we find methods of treating the dead which differ from the historic customs, they should represent earlier practices, although individual examples may be contemporary in age with bone-cleaning as the result of the retention of old forms even after the new had become generally accepted.

The manner in which the old and the new can be combined seems to be demonstrated by the southern Delawares of 1654. As we have seen, the bodies, before the cleaning of the bones commenced, were first buried in a partially flexed position seated upon a "stool." Apparently this was an old method of burial which was continued as a preliminary step to bone-cleaning after the latter had been introduced. Such a posture on a seat of stone or wood was observed in the 17th century for the Algonkian inhabitants of Manhattan Island, and Bushnell gives the opinion that it was practiced by kindred tribes in the lower Hudson Valley.[15] That it was formerly common among the intervening Delawares of Pennsylvania and New Jersey has not been established by observation or by archaeology, but can be inferred on the basis of distribution. That it formerly was practiced farther south, in Nanticoke country, is demonstrated by the unique group burial found

[15] Bushnell, op. cit., p. 19, citing Van Der Donck.

at Cambridge, Maryland, in 1883, when excavations for a new jail were being made. At the time a circular pit about 16 feet in diameter and 7 feet deep was uncovered, in which it is stated there were 16 *articulated* skeletons in a circle, each seated on a stone and facing inward.[16]

Although it seems likely that the group arrangement in this burial represents a special case, the placing of the body on a seat is consistent with reports from areas to the north and for this reason it would seem permissible to regard seated burial as a type of inhumation practised before bone-cleaning came into the area, in spite of the fact that this site is not known to have been stratified.

III

Additional information on Nanticoke methods of treating the dead was recently secured by the writer during various trips to the Delmarva Peninsula for the purpose of a general archaeological reconnaissance.[17] In this State of Delaware attention tended to center in an extensive site, presumably Nanticoke, at Slaughter Creek about ten miles south of Milford. Here, as time and circumstances permitted, a number of testings were made and in the course of these activities five skeletons in three interesting types of burial were encountered. These not only indicate variations from the methods previously described but contribute to the involved problem of chronology in this region.

Burial 1 (Plate 10, Figure 1). This burial, found in May, 1934, consisted of a single partially disarticulated skeleton in a small undisturbed burial pit.[18] The pit was oval in shape and had been dug to a depth of about 36 inches in the soft, sandy soil. The walls were precipitous and clearly defined, a condition typical of all pits in this area, refuse or otherwise.

Below the plow-line there were no artifacts or objects of any kind except a few potsherds and oyster shells. The former are typical of what may be considered tentatively as of late prehistoric-early historic ware, characterized by vessels with pointed and rounded bases and by incised ornamentation in a triangle motif along the straight or slightly everted rims. Many vessels, however, are not incised. The largest sherd from this grave was neatly decorated with a rectangular pattern, an unusual motif at this site.

[16] MacLeod, op. cit., p. 208, citing Reynolds.

[17] On behalf of the Faculty Research Committee of the University of Pennsylvania.

[18] Excavated by the writer, Mr. Loren C. Eiseley and Mr. Richard Faust, graduate students in anthropology, University of Pennsylvania.

Below these objects and resting in some instances directly upon the bones was a thin undulating layer of charcoal which extended over most of the skeleton. This layer had not been disturbed and this condition may be taken as proof that the grave had not been molested since interment.

The skeleton was disarticulated in such a manner that it is obvious that the remains had been placed in the grave in a partially dismembered condition but with an attempted arrangement in their normal positions. The head, articulated with the jaw, had been laid in the southern end of the grave and turned on its left side to face west. The atlas was found about 15 inches to the north lying on the right scapula which in turn covered the left scapula. The cervical and thoracic vertebrae and ribs, for the most part disarticulated, lay in a disorderly mass between the scapulae and the pelvis, as if they had been placed in the grave in part as loose bones. It is conceivable, but hardly plausible, that their arrangement could be the result of collapse if the decapitated trunk had been set in the grave in an inclined position.

Each arm was completely articulated and had been put into the grave as a unit. The head of the left humerus had been placed opposite the foramen magnum. The arm itself, in a straight position, extended westward with the hand resting upon the wall of the pit. The right arm was bent in both elbow and wrist, and placed in such a manner that the upper arm was below the left upper arm, and the right lower arm hooked over the left lower arm, which it crossed at almost a right angle. The right hand was bent sharply downward to give a deformed appearance.

The lumbar vertebrae, sacrum, ilia and the leg bones were fully articulated except for the left foot which was missing. The knees were slightly flexed and pointed to the west.

In view of the general practice of bone-cleaning in this area, it seems reasonable to believe that this burial represents the interment of a skeleton partially disarticulated as the result of bone-cleaning rites and partially articulated because some flesh had dried, by accident or by design, to hold together various bones and groups of bones.

There are a number of features associated with this burial which differ somewhat from the historical accounts of interment for this general area. Whether these peculiarities are unique in this instance or represent more common but unrecorded burial customs of the Nanticoke tribe in general or of the sub-tribe which inhabited this locality, can not be determined until our knowledge of burials has been expanded considerably.

In the first place, it is important to note that the remains are those of an adult female between 22 and 40 years of age.[19] This fact is in keeping with other evidence that the Nanticokes, like the southern Lenape in historic times, practiced bone-cleaning on the bodies of women as well as men.

Secondly, it is interesting to find a partially articulated skeleton occupying one grave in contrast to the reported ossuaries.

Thirdly, there were no objects in the grave to indicate rank but, if the cleaned-bone skeletons of commoners were disarticulated as other evidence tends to show, it may be that this young woman was of chiefly rank. However, in such an event it appears that she could not have been mummified, wrapped in skins and laid away as in the Virginian fashion, else we should expect her arms to be next to her body.

Fourthly, the layer of burned material over the remains introduces a factor not previously described for this area, although, as we have seen, the bones in the Choptank ossuary seem to have been deposited upon a fire base.

Lastly, the skull is brachycephalic (81.0) in contrast to the meso- and dolichocephalic skulls previously found in the Nanticoke area. Although at this time it is impossible to discuss the historical significance of a broadheaded element in the local population, it should be noted that since the site as determined by pottery features seems to be a late one, the appearance of brachycephaly is not inconsistent with evidence from other northeastern areas.

No particular problem, however, may be involved in the single burial. Customs probably were not consistent throughout the Nanticoke region or even within local areas. Furthermore, before the bone-cleaning complex was introduced from the south, the Nanticoke probably buried their dead singly except occasionally when several people were inhumed at one time. It is quite possible, therefore, that this burial may represent a combination of the old and the new in Nanticoke burials, the old custom of single burial with head to the south, as suggested by the questionable analogy with the modern Chickahominy of Virginia, combined with the newly introduced bone-cleaning practices and the associated rites over the remains before final interment. Since, as we have seen, these southern customs were probably not of great antiquity in this region, situated almost on the northern periphery of distribution, one should expect to find that old customs were contemporary with or combined with the diffusing practices. This would

[19] I am indebted to Mr. John Noon for his detailed study of the skeletal material.

seem to be particularly true if this burial belongs to the late prehistoric period, at which time bone-cleaning may have been new for this area.

Burial 2 (Plate 10, Figure 2). This burial was found October 7, 1934, at the side of a refuse pit, the upper and outer edge of which covered it.[20] The first intimation of a grave in this unexpected location was given by a member of the Civilian Conservation Corps who, instead of defining the limit of the pit as requested, dug into it and brought up the entire skull pan on his shovel. Since the bones were in a fairly fragile condition, the shovel made a clean cut and restoration has been possible.

Upon excavation, the skeleton was found to be in a partially upright flexed position with head inclining toward the south. The skeleton was completely articulated with the exception of the bones in the right arm, which were only slightly out of their normal position. Dr. J. A. Mason, who excavated this grave, noted that the ulna lay about two inches from the humerus at the elbow. The radius was parallel, but slightly disarticulated. The pelvis was broken but articulated with the femora. The disarticulations in the arm may have been caused by the original digging of the refuse pit, for the right arm was close to the inclining bottom which continued upward and over the grave. Indeed, it may have been the discovery of the grave which caused the diggers of the refuse pit to limit its extension on the western side, although there was no evidence to indicate that the skeleton itself had been exposed by these activities.

The upper portion of the grave below the plow-line was definitely a part of the refuse pit and contained the usual abundance of oyster shells mixed with dark earth and a few fragments of pottery. However, the lower part, containing the skeleton, had been filled with plain, clean earth, apparently just as it came from the grave pit, and contained no sherds and only a few stray oyster shells which seemingly could not have been intrusive from the refuse deposit. If the grave had been later than, and intrusive into the refuse pit, it would seem that it would have been almost impossible to have avoided the mixing of the dirty refuse material with the newly-excavated earth. These reasons and the limits of the refuse pit appear to indicate that the grave is the older.

[20] The excavations on this date were made by a party which included Dr. J. A. Mason of the Museum of the University of Pennsylvania; Mr. A. Crozier and Mr. G. Omwake of the Archaeological Society of Delaware; Officers and men of Co. 1226, CCC., Camp 2, Milford, Delaware; and the writer.

No ornaments or artifacts of any description were found in the grave, although there were several scores of small univalve shells which seem to have been scattered over the remains. Since none were perforated, they could not have been strung as beads and their purpose, therefore, could not be determined.

The skeleton is that of a middle-aged female between 37 and 40 years of age. The skull is longheaded (74.3) and thus corresponds to what is assumed to have been an original dolichocephalic people along the eastern seaboard.

The age of this grave cannot be indicated. It seems to be relatively older than the refuse pit, as we have seen, but whether it may have preceded the latter by one year or one century or longer, we have no means of determining. Nevertheless, it is important to note that the burial is in a flexed position, is in a single grave, and appears to be orientated with the head toward the south. Unless we are to assume that the flesh had been scraped from the bones and the skeleton left articulated in a *flexed* position, a practice for which there is no substantiating evidence, historical or otherwise, it would seem permissible to regard it tentatively as an *indication* of a local method of disposing of the dead *before* the introduction of bone-cleaning, although this particular grave may have been contemporary with the practice of bone-cleaning in this area.

There is a possibility that this type of articulated flexed burial may be related to the methods of interment described for the north and the south, whereby the body is placed on a seat. Stone is extremely scarce throughout this area and this condition must be taken into consideration in any attempt to compare and contrast varieties of "seated" burial. On the other hand, wooden "seats" could have been used, but there were no indications of such in this grave.

It is unfortunate that this burial cannot be associated with pottery or other material culture traits. At present we have no evidence as to the relative age of round-bottomed vessels or of incised ware. Possibly they had been present for some time before bone-cleaning came into the area. If so, pottery types may be found to be much the same in both cleaned-bone burials and the type or types of interment they displaced. Theoretically it should be possible to find more simple ceramic types associated with some earlier method of disposal of the dead.

Burial 3 (Plate 10, Figure 3). In the same refuse pit which covered Burial 2, a nested burial of three completely disarticulated skeletons was found. The skulls, two lying on the right side, the third inverted,

had been placed on the various long bones which in turn covered the small bones placed in a mass at the bottom.

It was obvious that these remains represent an intrusive burial in the refuse pit, for they rested upon a six-inch deposit of refuse consisting of dark earth, oyster shells, potsherds and broken animal bones, typical of the entire pit. The oyster shells over the bones were not arranged in any order and appear to have been thrown back on the skeletons haphazardly. There were no artifacts associated directly with the burial.

The skulls indicate that the three individuals were males. One, that of an early adult between 14 and 22 years of age, is mesocephalic, with an index of 76.4. The second and third skulls show signs of maturity; one, between 40 and 60 years of age, the other between 43 and 49. Their cephalic indices are 70.9 and 72.9, respectively.

On the basis of pottery types and their decorations, it appears that this triple burial belongs to the same period as Burial 1, that is, of late prehistoric or early historic times, although the two interments may have been separated in time by several decades or even centuries. Their general contemporaneity, however, shows that the local population varied in cephalic index at least between 70.9 and 81.0 during this late period.

Since all the bones were completely disarticulated and no attempt was made to reassemble them in their proper order in the grave, or to keep those of each skeleton separate from the others, we have hints of similarity with the reported Nanticoke methods of treatment of the dead in 18th century Pennsylvania and 19th century Kansas, where the bones were assembled for the ceremonies, apparently as loose, cleaned bones and not as articulated skeletons. For these reasons, it may be that these remains are those of commoners and not chiefs, although we are still uncertain as to the exact customs associated with the bodies of chiefs in this tribe, except that they were preserved, presumably, in a manner similar to that in Virginia.

IV

On the basis of the evidence discussed, it seems permissible to draw the following tentative conclusions, subject to check when additional facts have been gathered.

1. The methods of treatment of the dead by the historic and late prehistoric Nanticokes seem to include:

a. Mummification of chiefs, with the final means of disposal of the remains not yet known archaeologically, but stated to have been in ossuaries.
b. The practice of bone-cleaning of the bodies of commoners with complete disarticulation of the skeletons and final wholesale burial in large burning ossuaries into which the bones appear to have been thrown more or less indiscriminately.
c. Bone-cleaning and disarticulation and final group burial with a mixed but neat arrangement of the bones, the skulls being nested on the top.
d. Single burial of a partially disarticulated, partially articulated skeleton apparently not mummified, at least in the described Virginian fashion.
e. Equal treatment for the remains of males and females.

2. It is suggested that the methods of disposal of the dead before the introduction of bone-cleaning seem to have included:
   a. Single flexed upright burial.
   b. Partially flexed seated burial.
3. The Nanticokes appear to have not placed artifacts of any description in the burials.

TREE RINGS—THE ARCHAEOLOGIST'S TIME-PIECE[21]

EMIL W. HAURY

SINCE 1929 Southwestern archaeology has stood on a much surer footing than at any other time in the history of its development. This stabilization is due to the research of Dr. A. E. Douglass of Tucson, Arizona, whose inquiries into the reaction of trees to weather, from an astronomic standpoint, led, as a ramification, to the use of the annual growth rings in trees in dating the pre-Spanish remains of man in the Southwest. From the standpoint of the archaeologist, the most significant progress date in Dr. Douglass' study was June 22, 1929. On that day ended a long search for a particular sequence of rings needed to complete the ring record. This sequence was found in a log in the Showlow ruin, and united two chronologies then extant, the one a floating series of five hundred and eighty years, the other an historic series extending from 1929 to about 1280 A.D. The great value of the joining of these two series lay in the fact that it became possible, for the first time, to speak of the age of the Southwest's foremost ruins in terms of the Christian calendar. By this one step, forty old villages, occupied by the Pueblo Indians before the arrival of Europeans, were placed historically. That this achievement was possible where written records were not kept seemed unbelievable; that the discovery was made by an astronomer who utilized material thought worthless by the archaeologist seemed still more incredible. But, in the brief six years which have elapsed since the Showlow log was found, the Southwestern student has come to take dendrochronology, or "tree time," as a matter of course, giving data gained through this medium precedence over knowledge gleaned in any other way. In fact, it may be stated without equivocation that the tree-ring approach has been the greatest single contribution ever made to American archaeology. In the regimentation of facts it has taken priority over typological and associational studies, even over stratigraphy which heretofore had proven itself the most valuable control. Tree rings and stratigraphy have shown themselves to be complementary and have combined to build a chronology which shall endure. The whole-hearted acceptance and the continued use of

[21] This paper is one of three read before a symposium on "Trees: Recorders of History and Climate," held at Santa Fe, New Mexico, on May 1, 1935, in connection with the Southwestern Division Meeting of the American Association for the Advancement of Science.

the tree-ring approach by the Southwesternist will be an undying tribute to Dr. A. E. Douglass, the inventor of the system.

Since the finding of the first date ever to be derived from a pre-Spanish ruin, Kawiakuh in the Jeddito Valley, in 1928, many ruins, large and small, aggregating well over two hundred, have been dated by Dr. Douglass and his students. Impressive as this figure is, it is nevertheless admittedly small and forms but a very meager percentage of the ruins for which a potential date is possible.

The locality now affected by tree-ring dating in the Southwest may be limited by Mesa Verde on the north, Prescott on the west, Globe on the south, and Pecos on the east; thus including practically all of the plateau and mountain area. In the main, this area includes the sections where Basket Maker and Pueblo remains are the most dense. It is not too much to hope that extensions will be made from this region to include other cultures whose position in time can now be determined only by less satisfactory means. Especially bright are the prospects of carrying the system to other archaeological areas, as, for example, the Mississippi Valley.

Through painstaking research and the application of a rigorous procedure in the study of tree rings, Dr. Douglass has been able to establish a chronology for the Southwest extending in an unbroken line from the present almost to the time of Christ. Quoting from the Annual Report of the Chairman of the Division of Plant Biology of the Carnegie Institution,[22] Dr. Douglass writes:

"The long southwestern tree-ring records . . . have given a rainfall history, back to about 650 A.D. Two earlier sequences of 'Basket Maker' age, secured by Earl H. Morris, were joined together in March 1933, making a total length of about 800 years. Since January 1932, a definite relationship of the more recent of these to modern chronology has been under consideration. This connection was found in a superb specimen from Chetro Ketl collected and dated by Miss Florence M. Hawley in December 1931. This has been supported by many others, and has enabled us to carry a well-established chronology back to about 200 A.D. and a somewhat complacent record to 11 A.D. A few excellent charcoal sections of prehistoric beams collected in 1927 by Mr. Morris have been identified as dating near 350 A.D."

This chronology has a two-fold value for the archaeologist. First, it holds the key for dating countless other ruins that fall within its span,

[22] Year Book No. 33, for the year 1933–34.

for wood which has not yet been excavated may be compared with this ring record at any time in the future; second, it offers a weather record, a story of years of drought and of plenty, which opens a large field for study along ecological lines. Owing to local variations in the ring patterns, the master plot or chart of the rings which we now possess does not operate over the entire Southwest. Rapid strides are being made annually to remedy this by the construction of new chronologies. The net result of these studies will bring an even wider area into the picture where dates may be obtained from ruins. In that section where the chronology has functioned with the most success, we find that ruins have yielded dates which fall into a span of more than thirteen centuries, beginning with about the year 1700 for the latest, and extending to about 350 A.D. for the earliest. It may be fairly stated that the lower limit has not yet been reached. The significance of this naturally is that, where so great a span of time is involved, a new means is supplied for arranging antiquities into stages without the need of cumbersome and often inexact nomenclatures. But more than this, the span of years into which we now know that Basketmaker III and Pueblo IV ruins fall has been an eye-opener as to the rate of culture growth. The ages estimated for some of the major and late ruins on purely empirical grounds were shown to be somewhat too high by the actual dates, but the discrepancy was not inordinately large. Further, the order of periods was unchanged, which in itself is an excellent commentary on the reliability of the methods developed in local research prior to the addition of dendrochronology. For the earlier stages in Basketmaker-Pueblo growth, however, the estimates were considerably in excess of the actual dates. To be specific, dates for those Basketmakers who possessed pottery, which were generally placed before Christ, can now be carried forward to at least 700 A.D. As a consequence, the periods following Basketmaker III are later than heretofore supposed, Pueblo I, for example, dating from the late 700's to approximately 900, and Pueblo III at its zenith dates about 1100. The evident fact is that the development from primitive beginnings to the peak of achievement was a swift one, and did not require the centuries of laborious evolution generally imagined. In this point, then, dendrochronology has brought about perhaps the most revolutionary single element in archaeological thought. We have also learned that the development did not progress equally over a wide area; in marginal areas a Pueblo II stage had been reached when at other points Pueblo III was already in full flower.

Reviewing the distribution of dated ruins within the present time

scale, we find that sites placed culturally in Pueblo III and IV, dating from 1000 to 1350, are most numerous, thus giving us the fullest data on those stages. With the exception of the Flagstaff area, Pueblo II is practically undated and, for Pueblo I, dates are available for both the eastern and western variants. From this point back, the information is very sketchy.

As I see it, there are three angles in the tree-ring-archaeological relationship which must be considered. These are: the field angle, covering the collecting of the beam material; the laboratory angle, embracing the dating of the wood or charcoal samples; and the interpretative angle, in which the facts discovered in the preceding step are integrated and fitted into the background.

For the first of these, it is unnecessary to go into detail, as the field man is already acquainted with the general methods and requirements.[23] Sampling in standing ruins requires specialized equipment, and should be done with due regard for the antiquities involved. The recovery of charcoal and decayed wood from open sites is also beset with special problems which must be met as they arise. Success or failure in getting satisfactory dates, i.e., the final growth layer of the tree, may depend upon the method of handling the beam material in the field by the field technician, for neglect or improper treatment may cause a partial loss of outer rings on fragile specimens.

Looking at the problem from the angle of one who dates the wood, I believe it cannot be too strongly urged that the excavator himself should have a fundamental knowledge of woods, and the utility of ring types. With such knowledge, laboratory work could be reduced to a minimum. However, a wise policy to pursue at all times, whether conversant with the subject or not, is to save all material about which there may be any doubt. The excavator's task does not stop with the selection and care of the material, for, if improperly recorded, certain desired information will assuredly be lost. Wood should receive the same careful attention that is accorded to all other types of specimens. The fullness of the results will depend to a degree upon the thoroughness and wideness of the sampling. The more rooms giving beam material, the better the growth changes of the structure and the history of the culture will be understood.

The second phase, the dating of the wood, is beyond a doubt the most important and crucial step of the three, for inaccuracies will in-

[23] McGregor, J. C., Tree Ring Dating; Museum Notes, Museum of Northern Arizona, Vol. 3, No. 4, 1930.

evitably lead to chaos in the third step, the interpretation. This is to say that to express the cutting date of a log as 1100 A.D. definitely places it; the quantity is unchanging; it is either right or wrong. The weight of the decision naturally rests upon the individual who undertakes the dating, and his responsibility is therefore very great. This dictates that he should proceed with sound and discerning judgment based upon substantial facts. By common consent, it was decided at the tree-ring conference at Flagstaff in 1934 that at least two competent individuals should agree on any date before such a date is published, thus verifying its accuracy.

Some misunderstanding has been created in the past by the failure to specify whether a published date was the bark date[24] or that of the innermost ring of the log. For the archaeologist, the bark date only has real or primary value. On the other hand, the innermost ring and those intervening are of interest to the student concerned with chronology-building and cycle studies. It is therefore the further duty of the examiner of the wood to state the true condition of the date, whether derived from the final ring or from the last ring on a specimen with an indeterminate number missing. All these points must be seriously considered in the interpretative angle.

A few words may be said at this point in connection with the release of tree-ring data. It is naturally desirable that dates be released as soon as possible after they have been determined. It is realized, however, that the reports in which they should properly be published may be years in preparation, and that their immediate publication through normal channels may not be feasible. To meet this contingency and others, the idea of issuing a tree-ring bulletin was conceived less than a year ago by those vitally interested in dendrochronology. It was felt that the long delay in the issuance of dates might retard the advancement of the study, especially in chronology building, and at the same time withhold vital information from the archaeologist. The publication of the dates in a small quarterly in no way detracts from their value in the final published form. To endow such information with maximum value, it is desirable that together with data as to the origin of the wood, the sap-heart date, bark date, etc., the culture affiliation should also be stated as clearly as possible. Without this the dates have little or no meaning to the archaeologist. If, in the tabular form of presentation, the lack of space demands the use of Pueblo I, Pueblo II, etc., the

[24] Denoting the final layer of woody tissue grown by the tree, occurring beneath the bark.

variants of these periods should be explicitly stated. For the benefit of those concerned with the dating of wood, a combined chronology reproduced in a line cut would also be invaluable, for, by this means, information as to local differences in the ring records could be uniformly and inexpensively disseminated. I should like to emphasize the fact that, since the student's reliance on or rejection of, tree-ring data will depend largely upon its fullness and the form of publication, this step should be carefully planned.

We now come to the third consideration, namely the interpretation of tree-ring facts from the standpoint of archaeology. We may ask at once, are there any standards of correlation which may be offered for general acceptance? While to answer this question requires some discussion, it may be admitted from the start that each case in which tree-ring dates have contributed to our knowledge of ruins, special circumstances demanded special consideration in the interpretation, and that a formula or group of standards cannot be absolutely set down. To restate the query put a moment ago, to what extent can we rely upon wood from a room in order to date the masonry and the associated artifacts? An answer can be given only after a careful inspection of the related facts, as wholly different explanations may be controlled by these.

One of the first points to be considered is the question of cutting date, versus deadwood date. This is to say, does the bark date on a log represent the actual time of cutting by the people who built it into their dwelling, or does it represent the last year of the life of the tree which died through natural causes and stood or lay in the forest for a long period before being selected by man? It is generally believed that deadwood or wind-fallen trees were infrequently utilized, first, because this type of wood is much more resistant to the axe than green or live wood, and secondly, in the case of pine and most woods in the local forests, it soon decays and becomes unfit for use. If used, however, it must have been rarely, since the task of hunting out proper deadwood in the forest would probably exceed that of cutting fresh logs. An occasional piece thus incorporated into a structure in which the beams were dominantly live wood, would give an earlier date. It could be largely discounted since precedence, in most instances, must be given to the most recent dates. Exceptions to this would be cases of remodelling or replacements, i.e., fresh logs built into an existing building. Further support for the use of live wood is obtained in cases where a series of logs from a single room terminate with the same ring, representing the same year. In one instance with which I am acquainted, twenty-four

logs from a pithouse gave the same terminal date. The probability of the occurrence of this condition, if deadwood has been selected for the structural beams, is extremely small. Repetitions of this case call for a generalization to the effect that live wood was generally used, and that the final ring can be accepted as representing the construction time. One condition that may introduce error is the possibility that beams once cut were not immediately used, but were allowed to season in order to avoid sagging. Although seasoning of logs is practised by the [Pueblos to some extent, it cannot be positively asserted that this procedure obtained in ancient times. A variation of a year or two in the dates of logs of a given house may suggest this. If seasoning prevailed, house-building was definitely planned a year or two in advance, a condition which was probably not general. Emergency situations must also have arisen which demanded immediate construction. Admitting that a year or two elapsed between cutting and construction time, the factor is so small as to be trivial, and the problem resolves itself into a very minor one.

While wood found within a room is most apt to be related to it structurally, several other conditions may also prevail which might prove to be disturbing factors in the interpretation. For example, charcoal from the fireplace might conceivably give far more recent dates than the roof beams. Where the structure has been burned, it may not always be possible to segregate wood from the two sources. A further confusing situation might be created by the dumping of discarded wood into an abandoned room which was being filled with rubbish; however, here the nature of the wood and its position in the fill will usually give some clue as to its origin. Logs found as an integral part of the house, i.e., built into the walls or lying on the floor in such a position as to indicate clearly that they were once in the roof, are naturally the most convincing in offering construction dates. Let us take an ideal case to see what possibilities might arise where definite structural wood is being dealt with. Say that six major logs supporting a roof give, in each case, the same bark date of 1300. Little leeway is possible here in interpretation, for the odds overwhelmingly favor that date as the time of construction, or within a year or two in case of seasoning. Should one of the logs give a date of 1150, the obvious discrepancy of 150 years can best be explained by supposing that that particular log was salvaged from an older structure. This situation is known to have occurred in the past, as witness the log taken from a house in Oraibi a few years ago which was cut in the late 14th century.[26] Or we may find that one or more

of the logs gives a reading of 1350, fifty years later than the remaining five. In this event, a repair or replacement may be indicated. It is further conceivable that each of the six logs will give different dates, probably indicating a heterogeneous collection of beams, in which event only the latest date will be of any particular value. Such a condition must be rated as highly unsatisfactory. It will be readily seen that the various situations thus outlined will, in one way or another, affect the interpretation. Each set of circumstances presents a particular problem, the solution of which cannot be reached by pre-arranged standards.

A similar set of conditions may be visualized in working out the relationship of the dates of a room to those of the artifacts contained within. To put this as a question: Are the artifacts within a house approximately the same age as the house itself? Generally speaking, they are; however, in some instances they may be more recent. This is said with full recognition of the possibility of finding old pottery and the like in recent rooms, and recent materials in rooms which have been occupied for a long time. In this case judgment must be influenced by the archaeological conditions. The best form of proof for dating artifacts in this manner lies in the consistent appearance of a trait or traits within rooms of the same general age. This is to say that group data became the decisive factor. For example, the Canyon Creek cliff ruin,[26] located on the Fort Apache Indian Reservation, offered eighteen datable rooms out of a total of about sixty. These rooms are scattered throughout the length and breadth of the structure in both the first and second stories. The artifacts from all rooms were uniformly of the same generic kind, reflecting no period changes, and the range of dates from the eighteen rooms was between 1326 and 1348. From this it may be concluded that the material culture is of comparable age, or perhaps a little later. It can be unerringly dated to the 14th century. This angle of tree rings and archaeology is one of the most vital, and, because of its admitted importance, a correlation should not be attempted without full comprehension of all related information.

Once material culture has been satisfactorily dated in a region, objects native to that place, but alien to another, become valuable time indicators. In such cases tree rings are directly responsible for ordering the data in the primary area, and indirectly in the adjoining area. The

[25] Douglass, A. E., The Secret of the Southwest Solved by Talkative Tree-Rings; National Geographic Magazine, December 1929, p. 754.

[26] Haury, E. W., The Canyon Creek Ruin and the Cliff Dwellings of the Sierra Ancha; Medallion Papers XIV, Gila Pueblo, Globe, Arizona, 1934.

value of this approach is particularly high in such regions where, owing to physiographic and other conditions, tree rings may never be utilized. The time status of the Hohokam of the Gila Basin has been worked out chiefly by this method. The same principle will doubtless be brought into play in the study of Mexican and Mississippian cultures.

Exact as a date may be, it is not possible to value each one equally. Distinctions arise which are governed to a certain extent by conditions already outlined, and by others which will be mentioned presently. We need to consider the value of a single date versus many dates, first, from a one-type site, i.e., one in which the occupation was short and the material culture all of one phase, and second, from a site long occupied, in which growth changes are apparent. An individual date from a one-type ruin can be more rigidly interpreted than one from a large complex site, since, in the former, there was little opportunity for old beams to be re-used and for other disturbing factors to creep in. Single dates may be strengthened by dates from other sites of approximately the same age and cultural association. As an example, two dates from Gila Pueblo, a one-type ruin, are 1345 and 1385. While these are indicative of the age, there is of course room for error. However, with dates ranging from 1326 to 1348 in the Canyon Creek ruin, and with a terminal date of 1383 for the Showlow ruin, both of which manifest cultural ties with Gila Pueblo,the dates procured at Gila Pueblo may be admitted as valid.

In the case of a site giving several stages, group data only will give satisfactory results, for individual dates offer too great an opportunity for misinterpretation owing to the possibility of re-used beams. One important case of this character is now before us. The earliest date from a ruin in the Southwest is about 350 A.D. This was obtained from a log found by Mr. Earl H. Morris in Mummy Cave, Canyon del Muerto. Archaeologically, it is known that this cave was occupied from Basket-maker II times, but the conditions were so confused that the association of the beam in question could not be positively determined. No matter how strong the temptation may be to date the culture on the strength of this log, it cannot legitimately be done until further dates or relevant facts have been gathered.

While we have been concerned so far mainly with dates from structural wood, Dr. Florence M. Hawley has also demonstrated the utility of charcoal fragments from rubbish heaps in the case of Chetro Ketl.[27]

[27] The Significance of the Dated Prehistory of Chetro Ketl, Chaco Canyon, New Mexico. The University of New Mexico Bulletin, Vol. I, No. 1, 1934.

The value of pottery sequences obtained from the study of daily sweepings of broken pottery and charcoal, as a check against information obtained in the building itself, needs hardly to be pointed out. This study also helps in solving the problem of the length of time involved in the accumulating of rubbish mounds.

So far, the climatic angle of tree rings and archaeology has only been mentioned. Yet here lies a very fertile field, for past weather and human activity are intimately related. In the present chronology, which just falls short of 2000 years, one extended drought and several short ones are recorded. We suspect that the most severe of these, the drought lasting from 1276 to 1299, profoundly affected certain of the Southwestern peoples, and was responsible in the main for shifts in the population at about that time. But so far we have done little more than look at the raw and isolated facts. Here the archaeologist must coöperate with the climatologist whose interpretation of the tree-ring calendar from the weather angle is needed before it is possible to carry the study forward along strictly archaeological lines.

We would do well to ask ourselves at this point whether or not the tree-ring data we now have conflicts with the archaeological evidence. It has already been intimated that, before the benefits of dendrochronology were available, the error of age estimates of culture stages increased progressively from recent to remote times. However, since this adjustment has been made in the minds of students of Southwestern archaeology, it can be said that no glaring conflicts, such as radically differing dates for the same cultural stage, have occurred. Indeed, should a violent disagreement occur, it would be well to look into the possibility of irregular conditions in the archaeological evidence. Improper release of dates and too rigid an interpretation, may tend to throw the facts out of alignment. On this last point, it is well to remember that, while a date may generally place a developmental stage, it does not delimit it. A problem relating to this part of the discussion has recently been raised by Mr. John C. McGregor, who, in dating wood from pit-houses excavated by the Museum of Northern Arizona, found a span of 150 years in bark dates from the wood of a single pit-house. Upon first consideration, one might say that the house was occupied for this period, and that towards the end of the occupancy, log replacements were made, thus accounting for the great difference in time. The improbability of a 150-year life for an underground house, and the lack of change in the material culture associated with it, in view of the more rapid changes general over the Southwest, tend to

temper this idea. But the problem is not easily solved. A likely explanation is that, in the construction of the house, the builders robbed an old dwelling for useful beams, adding to them others cut currently, and consequently of much later date.

Much, very much indeed, has been accomplished in the few years that dendrochronology and archaeology have joined hands, but the work has literally only begun. Some ramifications of the subject have been almost entirely neglected. Along lines of basic research more work is necessary. For example, master plots covering zones or more restricted areas than we now possess, would be invaluable in hastening the dating in marginal areas, as in the Mimbres, where certain fundamentals shown in the Flagstaff chronology were apparently not repeated. Fortunately Dr. Douglass and Mr. H. S. Gladwin are now at work on this problem and results may soon be expected. Research on woods other than those now used should lead to worthwhile results.

Extension of tree-ring dating to other areas is a challenge which cannot be overlooked. First steps outside of the nuclear area in the Flagstaff-Chaco Canyon sector, were made to the east in the Rio Grande where Mr. W. S. Stallings, of the Laboratory of Anthropology, has succeeded in the difficult task of building up a basic chronology extending to 1100 A.D.[28] In the Tennessee Valley, Dr. Hawley has obtained significant results from wood found in Mound-builder remains. Northern Mexico and possibly parts of South America may similarly prove to be rich fields. For the tropics, the outlook is not bright, although not altogether hopeless. In my opinion, illuminating work might well be done in Egypt where an abundance of useful wood of dynastic times is available. While the Egyptian chronology has been worked out with reliability on astronomic and historic ground, I believe it is not unlikely that tree-rings might well substantiate and possibly amplify this.

The degree to which success will come in the relationship of American archaeology and dendrochronology will depend largely upon the degree of coöperation among those vitally concerned in the study. Due to its involved nature, the welfare of the subject depends upon coördinated efforts. Lacking this, the most unique check yet discovered on the changing quality of human culture cannot bear its richest fruit.

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[28] A Tree-Ring Chronology for the Rio Grande Drainage in Northern New Mexico; Proceedings of the National Academy of Sciences, Vol. 19, No. 9, pp. 803–806; 1933.

A BRIEF METALLOGRAPHIC STUDY OF PRIMITIVE COPPER WORK

CURTIS L. WILSON[29] AND MELVILLE SAYRE[30]

A WIDE and interesting field for coöperation by metallurgists and archaeologists is the metallographic study of primitive metal work. The present paper is an elementary exposition of techniques which are familiar to every metallurgist but which may be simply applied by archaeologists in any metallurgical laboratory. The typical copper artifacts examined (Plate 11) were kindly given by H. C. Shetrone of the Ohio State Museum, W. C. McKern of the Milwaukee Public Museum, and C. E. Brown of the Wisconsin Archaeological Society. All the specimens are Lake Superior native copper, but they show different kinds of working. Several unworked copper nuggets from the Wisconsin mounds were treated in the laboratory for comparison with the native artifacts.

To study the structure of copper, a section large enough to form a field under the microscope must be polished on metal-polishing wheels, or more laboriously, by hand. Care must be taken in the final polish to eliminate scratches. The polished section is then etched for one minute by swabbing with a solution composed of one part ammonia and one part hydrogen peroxide, dried, and placed under the microscope, with a magnification of 30 to 65 times. From the structure of the section, the manner of working the artifact can be determined.

Native copper is precipitated in cavities in the rock, forming irregular masses of homogeneous copper. These weather out of the rock as nuggets—in the Lake Superior region, often very large nuggets—of pure copper.

If one of these nuggets is polished and etched, the microscopic section shows no grain structure, merely a plain bright field. If a nugget is cold-hammered or cold-rolled, the result is the same. Although the object becomes harder and more brittle after cold work, the microscopic section still shows a plain field. Consequently, any artifact which, in a polished section, shows no structure, has been worked cold and has not been annealed at any time. Some of the copper artifacts from the mound area are cold-worked. The hammered copper chip and the awls (Plate 11) are cold-worked, as their polished sections show no grain structure under the microscope.

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[30] Archaeologist, Montana Bureau of Mines and Geology.

A metal which is heat-treated or annealed, however, changes its structure strikingly. In Figure 1, idealized drawings illustrate what happens to the metal when it is melted. No. 1 shows a copper crystal with atoms at the corners of the cube and in the center of the faces. This

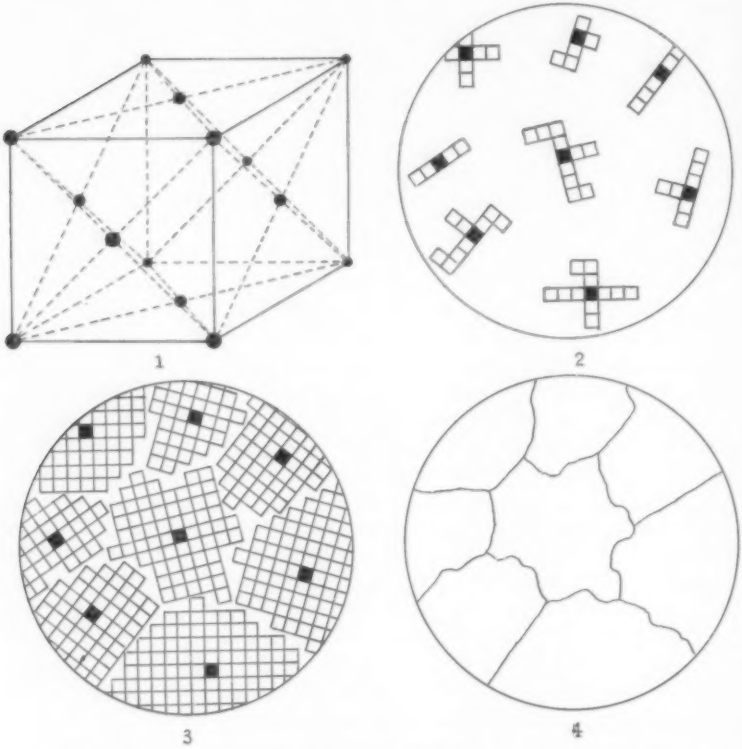
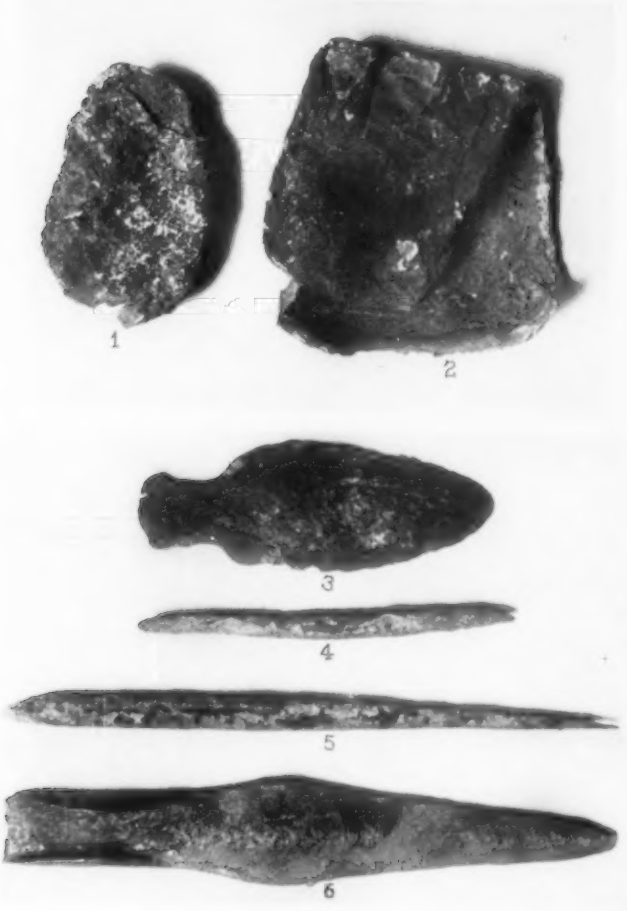
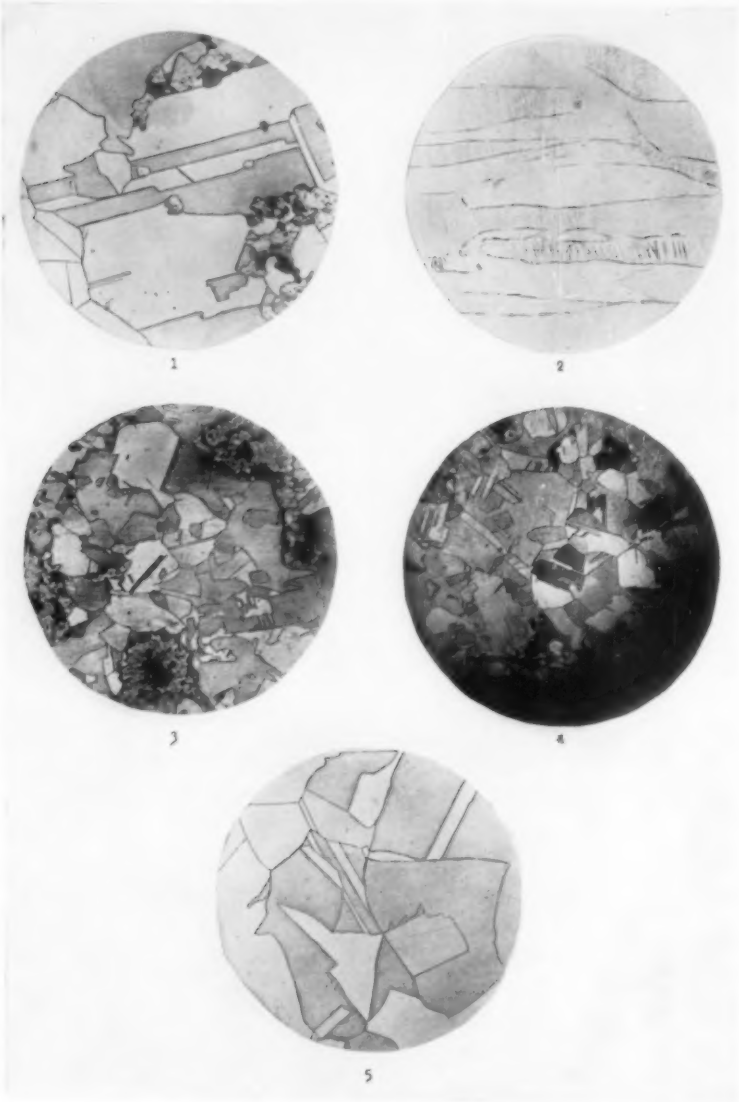


FIG. 1.—Idealized microscopic drawings to illustrate grain growth in metals after annealing.

represents the space lattice of a crystal unit of copper. When the metal is melted, the atoms increase their velocity until they have a disorderly arrangement. As the metal solidifies, the atoms once more fix themselves into crystal units which grow into grains, following definite axes of symmetry. A grain is a group of crystal units all having the same orienta-



1. Hammered chip. 2. Axe. 3. Arrow point. 4. 5. Awls. 6. Spear head.



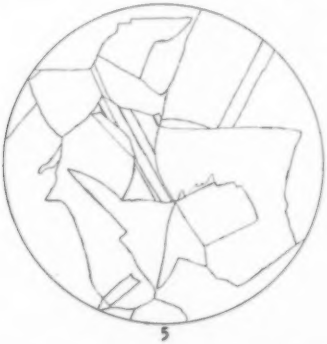
Photomicrographs of old Lake Superior copper.
Magnification 50x.

1

2

3

4



5

Drawings of photomicrographs shown in Plate 12

tion. In No. 2 these nuclei are gathering other crystal units along axes of symmetry, just as the metal begins to cool. If the metal is allowed to become cold without being hammered or otherwise worked mechanically, the grains will grow until no space between crystal units is large enough to accommodate another crystal unit (No. 3). In other words, every crystal has grown until it has reached the limits imposed by the surrounding crystals. A polished microsection then shows the grains (No. 4) divided by dark lines, each grain being approximately equiaxed: that is, right-angled axes of the individual grains will be approximately equal. The difference in brightness among the grains results from the difference in orientation of crystal units within the grains; although the crystal units within each grain have the same orientation, the grains are not oriented in relation to each other. As a result, the light will be reflected with different intensities from different grains.

If the metal is allowed to become cold or completely solidified, and is then cold-worked—hammered, rolled, or beaten—this mechanical working causes deformation of the grains. The crystal units tend to slip over each other's faces and the grains become distorted in the direction of working. These elongated grains then appear in an etched microsection as long, narrow bands with narrow, wavy lines running at right angles to the long axes of the grains (Plate 12, Figure 2).

Annealing this cold-worked copper causes the crystal units to group themselves once more into equiaxed grains, and further annealing produces the phenomenon of absorption of one grain by another, resulting in grain growth. The higher the temperature of annealing, the larger the grains will become. Moreover, the grains in copper which has been mechanically worked and then annealed exhibit twinning, which appears in the microsection as closely parallel, dark, straight lines cutting across the faces of the grains (Plate 12, Figures 1, 3, 4, 5). This twinning is characteristic of copper and of certain of its alloys, but does not take place in many other metals and alloys. Twinning always shows that the copper has been mechanically worked and then annealed. From the size of the grains and from the relative regularity of their axes can be determined the approximate annealing time and the approximate temperature achieved. Consequently, we can learn much about primitive man's methods of working copper from these etched microsections.

The photomicrographs in Plate 12 illustrate these metallographic facts: Figure 1 is a section of the spearhead from Wisconsin shown in Plate 11, Figure 6. This spearhead was hot-worked, at a bright red, about 800° C. and thoroughly annealed after being worked. The evi-

dence for these conclusions is: large, equiaxed grains, showing good annealing; twinning, indicating mechanical working. Note the oxidation, or patina, which has penetrated deeply, evidence of the antiquity of the spearhead.

Figure 5 is a section of a nugget of Lake Superior native copper from Wisconsin, worked in the laboratory under similar conditions to those under which the spearhead in Figure 1 was worked. The nugget was hammered and then annealed. The structure is similar to that of Figure 1, but no oxidation appears in the polished section.

Figure 3 is a section of the arrow-point from Wisconsin shown in Plate 11, Figure 3. This arrow-point was hot-worked, the work ceasing at about 500° C., not followed by annealing. The evidence for this is the occasional twinning, the different sized grains, and the unequal axes of many of the grains. Note the large oxidized sections.

Figure 4 is a section of the axe from the Ohio mounds shown in Plate 11, Figure 2. This axe was hot-worked, followed by good annealing, but at relatively low temperature, about 500° C. The evidence for this is the equiaxed grains, with some twinning, with uniform grain size throughout, but with all grains small.

Figure 2 is a section of another nugget of copper from Wisconsin, worked in the laboratory. This nugget was heated, allowed to cool, and then cold-rolled. The grains are elongated, without twinning, proving that the metal was not annealed after having been worked.

Even as brief a study as this, with a very small amount of material suggests many interesting possibilities for further research. After the primitive methods of metal working have been determined by metallographic methods, the archaeologist is faced with the task of classifying the results according to different cultures and to different areas. Furthermore, what tools did man use to handle copper objects heated to 800°? A stone anvil and hammerstones are known to have been used, followed by polishing with rubbing stones and with sand and water.[31] But what tools were used to handle the hot metal? How were some of the delicately shaped objects fashioned? Possibly some of the problematical stone objects from the Mound area, for which the use has never been determined, may have been the priceless gadgets of the primitive coppersmith.

[31] West, Geo. A., Copper; Its Mining and Use by the Aborigines of the Lake Superior Region, Bulletin of the Public Museum of the City of Milwaukee, 1929, p. 59.

ARCHAEOLOGICAL FIELD WORK IN NORTH AMERICA DURING 1934

Part 2[32]

Kentucky. During the late summer of 1934, Dr. W. D. Funkhouser, of the Department of Anthropology and Archaeology, University of Kentucky, excavated a mound in Montgomery County with the use of relief labor.

Wm. S. Webb,
University of Kentucky

Louisiana. At Marksville, Mr. Frank M. Setzler, of the U. S. National Museum, conducted excavations in the mound group in which Mr. Gerard Fowke had carried on work a number of years ago for the Smithsonian Institution. This important site produced some very interesting results, inasmuch as Mr. Setzler was able to establish definitely the existence here of a culture closely related to the so-called Hopewell culture of the Ohio Valley and other regions to the north.

Walter Hough,
U. S. National Museum

During the summer of 1934, the Louisiana State University continued the survey which has been sporadically in progress for several years. In September, the University took over the sponsorship and direction of the excavations being carried on by the E.R.A. in the vicinity of Lake Pontchartrain. A very extensive midden accumulation has revealed sherds apparently related to the Cole's Creek remains of north Louisiana and Mississippi, with evidence of eastern influence in the occasional presence of check-stamped ware.

Fred B. Kniffen,
Louisiana State University

Michigan. During 1934, the Division of the Great Lakes, of the Museum of Anthropology, University of Michigan, received reports on a number of interesting sites that were previously unknown. These came from the State Department of Conservation, the State Geologist, State Park Commission, county road commissioners, operators of gravel pits, and private land owners, and indicate the growing coöperative spirit that prevails among the various official and private agencies in-

[32] Part 1 appeared in this series, Vol. 1, No. 1.

terested in the development of Michigan's historical resources. All of the sites are being preserved for investigation as soon as facilities permit. Three or four were superficially examined. Some unusual skulls were recovered from old burying places in three sites in the southeastern part of the Lower Peninsula. No site was nearer than 30 miles to another. All the skulls, except that of a child, were adult. They had been perforated at or near the vertex. One had a second perforation within an inch of the foramen magnum. The borings are identical in appearance to those observed in common slate gorgets, and probably were made by the same kind of instrument and process. The holes taper from the outer to the inner tables as if made by a countersink, and the point of a common lead pencil fits into them very nicely. The skulls had not been detached from the skeletons, except that of the child and one adult. A distinction must be made between skulls that were perforated post-mortem, and trephining intra-vitem, both types of which have been previously reported from this state. More thorough examinations of these sites are to be made later. In one site there was a pair of leg bones placed in natural extension, with perforations through the proximal ends of the femurs and the distal ends of the tibias. Associated with, and mixed among the human bones were animal bones (those of the black bear being particularly in evidence), sherds, clay pipes, and other artifacts typical of the Michigan Woodland culture. A detailed report upon perforated skulls and other bones, and trepanization, giving distribution in this country and Canada, and making comparisons, is now in preparation.

W. B. Hinsdale,
Division of the Great Lakes
Museum of Anthropology
University of Michigan

Minnesota. Dr. A. E. Jenks, of the University of Minnesota, with Lloyd A. Wilford, Assistant, and a party of five students, spent 10 weeks during the summer of 1934 working on field problems of the Upper Marginal Lakes, mainly in Minnesota. Three weeks were spent at Forest Lake, eastern Anoka County, on a subsurface habitation site at a depth of three to four feet, covered by outwash sand from some stage of the Wisconsin Glacier which, since its placement by water, has been moved a good deal by wind. A fine Folsom point, a whole Yuma-Folsom point, and an atlatl stone weight had been picked up on the surface here. A broken fragment of a Folsom point and four

copper gorges (probably a pre-fishhook device for catching fish with bait) were found *in situ*.

A Yuma-Folsom point and 17 skeletal fragments of the "Browns Valley Man" in the gravel pit at Browns Valley, Minnesota, were discovered when this site was revisited in a successful attempt to confirm the finding of a man-buried human skeleton in association with Yuma-Folsom points. The skeleton now appears to be somewhat similar to the earlier reported ancient marginal types of Amerinds. The field party excavated a quarry pit west of the Missouri River (visited in 1933) because the above-mentioned Yuma-Folsom points were mineralized and resembled the material from this quarry. That mineralized wood is the best "flint" found in all the Minnesota surface and subsurface discoveries. Near Fertile, Polk County, the existence of an ivory culture ("Arvilla Gravel Pit culture") was confirmed on the Campbell beach of Glacial Lake Agassiz, Minnesota, as well as on the western Campbell beach in North Dakota. Dr. Jenks also found mound-buried ivory artifacts, as four armbands in place on lower arm bones, in a mound on the high Minnesota boundary cliff of present Lake Traverse. This cliff had also been the eastern boundary of Glacial Lake Agassiz near its southern outlet. The ivory at this site may be of the same age, or earlier or later, as that on the Campbell beach farther north.

A. E. Jenks,
University of Minnesota

Mississippi. From the middle of June to mid-August, 1934, the State Archaeological Survey of Mississippi conducted field work under the joint sponsorship of the Department of Archives and History, and the Smithsonian Institution. Moreau B. Chambers, aided by two student archaeologists, excavated at two sites and made surface collections at various others in Clay and Oktibbeha counties, a section lying between the traditional holdings of the Chickasaws and Choctaws. Nearly a month was spent in the partial excavation of the John T. Brogan Mound in Clay County, in which four extended and three secondary burials were found. According to local tradition, this mound was constructed as a burial place for the Chickasaws who fell in an engagement with the Choctaws during the 18th century. The smaller, or Choctaw mound, at this site was recently destroyed by highway builders. Our investigation, employing F.E.R.A. labor, yielded few artifacts and nothing of definitely European origin. The second half of the season was devoted to excavations at Lyon's Bluff, on Line Creek, Oktibbeha

County. According to historical accounts, the Chakchiuma tribe was exterminated at this site after a siege by the combined forces of the Chickasaw and Choctaw tribes. Test pits were dug in the kitchen midden along the creek bank and also in and near the ceremonial mound situated near the center of the village site. Good collections of sherds and broken animal bones were recovered. Eight burials, all flexed on the right side, were found in the area between the mound and the creek. There were few accompanying artifacts. Practically all the pottery from this site was shell-tempered. Broad strap handles were frequently employed on globular, necked vessels. The most common decorations on the vessels were thumb-nail imprints and raised knobs, with a smaller number of sherds typical of the thin black polished ware of the Mississippi Valley, ornamented with scroll designs. Several red-and-white painted sherds were also found, as well as a few sherds bearing designs characteristic of the Moundville component. Sherd collections from the other village sites visited in this section yielded material that ranged from the cord- and fabric-marked, grit-tempered sherds of the Tombigbee River Valley to the dissimilar culture of the Lyon's Bluff site.

Dunbar Rowland,
Mississippi Department of
Archives and History

Missouri. Early in 1934 an archaeological survey of the state was instituted under the direction of Professors Jesse Wrench and Brewton Berry, of the University of Missouri. In March and April, the work was expanded with the assistance of a C.W.A. worker in each county. In addition to locating archaeological sites, these assistants made a census of persons interested in archaeology, or having collections of artifacts. In June, Professors Wrench and Berry made an exploratory trip through southern Missouri verifying and photographing the sites that had been reported. The survey was resumed under the Professional Works Program in August, and a more carefully selected body of assistants was secured. This project continued through October. The survey, which is by no means complete, has resulted in the location of approximately 13,425 mounds, 950 village or camp sites, 168 caves that indicate habitation, and a number of trails, cemeteries, and other sites. Most of these were reported by untrained workers, and many will doubtless prove to be of no value. The large number of mounds is due to an abundance of the so-called "house mounds" or "garden mounds" in

southern Missouri, which some investigators have pronounced artificial, and some natural.

Brewton Berry,
University of Missouri

Montana. The State School of Mines at Butte carried on systematic exploration on the archaeology of the Great Plains. The results of this work will probably be published soon. The State University at Missoula was chiefly concerned, during the past summer, with recent finds of flexed burials. At present, these burials seem to have an affinity with the old Northwest Coast cultures described by Harlan I. Smith in his "Cairns of British Columbia and Washington."

Harry Turney-High,
University of Montana

Nebraska. During May, June, and July, 1934, the Nebraska State Historical Society continued its archaeological survey of the south central part of Nebraska. We were assisted by Waldo R. Wedel, of the University of California, and five volunteer students. A complete report of the work, written by Wedel, has been published in the Society's quarterly magazine. The excavation yielded very valuable archaeological information. Detailed notes were made as the digging progressed, and all house sites and burials were photographed and mapped. Fourteen earth lodges in eight different villages were excavated, making a total of 53 earth lodges excavated in 26 villages in the Republican and Solomon drainages. All houses excavated and artifacts found may be considered Upper Republican Aspect of the Central Plains Phase, Lost Creek Focus. Three of the houses were round, with diameters of 22, 26, and 29 feet; and 11 rectangular, dimensions of 24 by 26 feet to 48 by 51 feet; semi-subterranean type, 11 to 31 inches deep. All contained the four center posts and the covered doorway, 10 to 18 feet long. Thousands of artifacts of bone, stone, and shell were obtained. Twenty-nine pots, which have been restored, were added to our collection, making a total of 79 restored pots from the Upper Republican drainage. Pipes were of the elbow type, made of clay, gray lime rock or stone somewhat resembling catlinite, but of a coarser grain. While the end scraper predominated, a few of the side scraper type were found. Bison and elk scapula digging tools, tubular bone beads, charred corn, beans, and pumpkin seed give some indication of the mode of living. These and other materials from the Plains prehistoric village sites make a very

interesting and scientific collection at the disposal of students of archaeology.

Five burials were excavated on Rebecca Creek in Franklin County about one mile below a village in which we had excavated two earth lodges. The location of this burial ground was somewhat unusual, being on a flat or terrace, rather than on the nearby hill tops. It consisted of a series of small pits instead of the single large ossuary pit usually found in the Republican drainage. For the most part, bundle or secondary interment seems to have been the custom. Only one grave indicated possible flexed burial. The burials averaged from 15 to 40 inches below the surface. The bones were in bad condition and only a few could be saved. Mortuary offerings consisted mainly of fresh water clam shell beads, a few bone beads, and flint chips. Pottery was absent. A number of other sites along the small streams in the Republican Valley were examined, resulting in a series of interesting artifacts of bone, stone, and shell implements and ornaments, and pottery. It is planned to continue the investigation of some of these sites in 1935.

A. T. Hill,
Nebraska State Historical Society

During the 1934 season, the University of Nebraska Archaeological Survey continued work in Cedar County in northeastern Nebraska. The site was an extensive village of about 40 large semi-subterranean houses and adjacent burial mounds located in the bluffs of the Missouri. The houses were less prolific in artifacts than those excavated the previous year at St. Helena, but gave additional information on the culture. The mounds were of two types. The first was a stratified cumulative mound with pit burials beneath it. While the skeletal material was in very bad condition, every indication pointed to burial in the flesh in a flexed position. Associated cultural artifacts were rare, but apparently sufficient to link the mound to the village. The other mound was above an ossuary and did not contain any cultural remains which could be taken as evidence for its relationship to the village. In the uppermost strata of the first mound was the skull fragment of a very low-browed individual. It was as primitive in type as many of those for which Pleistocene antiquity has been claimed. A report on it written by Dr. Hrdlička and Dr. Bell appeared in the February-March-April number of the *American Journal of Physical Anthropology*.

Earl H. Bell,
University of Nebraska

Nevada. From the first of the year to the latter part of April, 1934, and again from early November until January, Mr. M. R. Harrington, of the Southwest Museum, continued the exploration of the group of early Pueblo ruins known as Pueblo Grande de Nevada and popularly termed the "Lost City" near Overton. The work was conducted under the State Park Division of the National Park Service in coöperation with the Southwest Museum, which receives a share of the collections and the privilege of publishing the scientific results. Last season, labor for the excavations was furnished by the 974th Company, C.C.C., stationed at Camp SP-1 near Overton; this season it was the 573rd Company.

The last week of June, a small expedition made possible by the coöperation of the Carnegie Institution of Washington went to the vicinity of Baker, where some preliminary observations had been made in 1932. Most important here was the Smith Creek Cave, which was found to contain fairly dry deposits averaging more than 12 feet deep. In these were bones of extinct horses and of other creatures, some extinct, some living, ranging from mice to the large American Pleistocene camel (Camelops). A number of the bones seemed artificially split for the marrow, and pieces of charcoal appeared occasionally, all of which indicate that this cave, if thoroughly excavated, may yield important evidence bearing on the problem of very ancient man in America and his association with certain long-vanished animals. The upper Baker Creek Cave seems another good prospect, because of its very deep floor deposits—again more than 12 feet—indicating long habitation in ancient times. These deposits contained ashes, fireplaces, and rude implements. While the bones of extinct animals were not found directly associated with man-made refuse, our test pit was of small diameter and such associations may exist elsewhere in the cave. Still another interesting feature of the expedition was the finding of crude stone implements along the shoreline of the Pleistocene Lake Bonneville on old camp-sites, most of which are now far from water of any kind. These implements resemble closely the articles found by Mr. and Mrs. W. H. Campbell on the banks of a long-extinct river near Pinto Basin in the Mohave Desert. A dry cave near Caliente was also visited, and offers an excellent prospect for the recovery of a fine collection of rare sandals, textiles, and wooden objects belonging to the early Pueblo period; things which survive the ravages of time only under exceptional conditions. This cave was discovered by Lieut. S. M. Wheeler, U.S.A., and Mrs. Wheeler, and reported in *The Masterkey* for January, 1935.

Following Mr. Harrington's suggestions, Lieutenant Wheeler has handled the preliminary work very well, but complete excavation of the cave must await the financing of an expedition.

F. W. Hodge,
The Southwest Museum

New Jersey. During 1934, the Archaeological Society of New Jersey was unable to sponsor any major field work, but many interesting projects were carried out by individual members. Mr. Charles A. Philhower, of Westfield, unearthed six flexed human burials and two dog burials at the Minisink site on the Delaware River. None contained artifacts. Seven pits on the same site yielded many fragments of pottery, animal bones, mussel shells, and stone artifacts; series of post holes were also located there. Near Wallpack Bend, Mr. Philhower investigated a series of storage pits, and found two small and two large decorated pots of Iroquoian type, as well as many fragments of pottery. Norman Lister, of Trenton, excavated a burial containing one adult and two infant skeletons; a refuse pit above the burial; and surrounding fire pits, in a site adjacent to the well-known Abbott Farm. In the burial, a 50-inch string of native beads with five wampum beads in the center was recovered, and the pits nearby produced two fine Algonkin pottery vessels, one 18 inches high and 15½ inches in diameter, the other about 24 inches high and 30 inches in diameter; rim sherds with Iroquoian designs, one with decorations on both sides; a 9½-inch long semi-lunar knife with upper edge incised; arrowheads, knife blades, axes, and other stone implements.

Kathryn B. Greywacz,
Archaeological Society of New Jersey

New Mexico. Again working in coöperation, the University of New Mexico, the Museum of New Mexico, and the School of American Research carried on six important field projects in 1934. One of these was in Central America. With the help of F.E.R.A., far more work was done in the field than in any previous season.

In Chaco Canyon, nine units of work were in progress. Three of these were at Chetro Ketl. The kiva in the west plaza of this pueblo was completely excavated. It proved to be of the "great kiva" type in its later usage, and of the ordinary kiva type in an earlier day. Excavation of the "East Tower Kiva" of Chetro Ketl, in progress since 1929, was completed this year after extensive repair and pillar-support work

had been done to make possible the clearing of the lower levels of this superimposed structure. The excavation of one of the small house units, named "Talus Unit No. 1", was continued from the previous season. The most spectacular find of the season at Chaco, in the form of nine excellent ceramic vessels, was made here. The dearth of pottery has hitherto been one of the features of the Chetro Ketl excavations. Other projects at Chaco were: (1) the excavation of Yellow House; (2) a study of erosion in the Chaco basin; (3) investigation of burials and burial customs, which included three investigations on small units; (4) reconstructions in oil of the principal Chaco ruins; (5) continuation of the archaeological survey; (6) climatic investigations of the canyon. The usual field school for graduate students was held, with an enrollment of ten.

The annual Jemez Field School had one of its most successful seasons with an enrollment above 50. Work on the Unshagi ruins was continued, and a new cave excavation was begun and continued through the fall and winter. A mummified child burial with five complete and well preserved robes, including buckskin, rabbit fur, and fur-and-feather was the first important discovery from the cave.

Bandelier's Puaray, located on the west bank of the Rio Grande opposite the town of Bernalillo, was the scene of a new excavation carried on from May through December. One of the pueblos believed to have been visited by Coronado, the ruins of Puaray yielded interesting Spanish as well as Indian material. The ruin of Kuaua, about two miles from Puaray, was also excavated during the same period. Excavation shows that at least a part of the town was destroyed by fire. This coincides with the historical designation of this pueblo as one destroyed by Coronado's soldiers. The work at Puaray and Kuaua will continue in 1935

The interior of the Mission of Quarai was excavated, and extensive repairs of the building undertaken to preserve the standing walls. The ruins of this early church are among the finest in the state and will be made a state monument in 1935. The mission is eight miles north of Mountainair and adjoins the pueblo ruins of the same name.

Edgar L. Hewett,
University of New Mexico
Museum of New Mexico
School of American Research

From December 1, 1933, to June 1, 1934, the Laboratory of Anthropology carried on excavations, jointly conducted by Stanley Stubbs

and W. S. Stallings, Jr., at a site named Pueblo Pindi, a Rio Grande Pueblo III site on the Santa Fe River opposite the village of Agua Fria, near Santa Fe. The river had cut a considerable distance into the pueblo, exposing a cross-section. This section was thoroughly studied; some 200 ground floor rooms, 3 kivas, and two-thirds of a large plaza with associated turkey pens, were cleared; two more kivas were tested for salient features, and representative testing of refuse dumps was done. The outline of the village, where not affected by the cutting of the stream, was determined. Three main periods of building in the pueblo proper, and an earlier horizon under the pueblo were found. A representative collection of material culture and a great amount of charcoal, mostly fragmentary but datable, was recovered. The last period of the pueblo ended when the first glaze-paint pottery of Rio Grande Pueblo IV was spreading over the area. The project was supported in part by Civil Works and Emergency Relief agencies.

From June 21 to September 19, W. S. Stallings, Jr., assisted by Mitchell A. Wilder, conducted excavations in two sites near Santa Fe, of the cultural horizon preceding that of Pueblo Pindi for the dual purpose of obtaining beam material which would extend the Rio Grande tree-ring chronology back beyond 1100 A.D., and of gathering information regarding the status of the local horizon and its time and cultural relation to the succeeding period. The first, where work was concentrated, is a unit site on the Santa Fe River opposite the mouth of the Arroyo Negro, and the earliest Pueblo site in the Rio Grande drainage in which excavations have been made. One multiple unit, consisting of 50 rooms, 4 kivas, and 2 large kitchens, open on one or two sides and originally roofed over, was completely cleared. The site is basically early Chaco in architecture and pottery. Testing operations were carried on at the second site, on the Arroyo Hondo, transitional between the Arroyo Negro site and Pueblo Pindi. Fourteen rooms and a pithouse under the pueblo were cleared, and three kivas tested for charcoal. A small collection of material culture and a large amount of piñon charcoal were recovered from both sites. These projects were also supported in part by C.W.A. and E.R.A.

During the months of July, August, and September, under the immediate and voluntary supervision of Mrs. Walter Trumbull of New York City, and with the part-time assistance of Stanley Stubbs and Ten Broeck Williamson, the Laboratory undertook the investigation of a large Rio Grande Pueblo IV site known as Los Aguajes, located on La Bajada Mesa 20 miles west of Santa Fe, for the purpose of increasing

knowledge of Pueblo IV culture of the immediate Rio Grande area; strengthening Laboratory collections in these cultural materials; and to obtain datable charcoal and beam material associated with these cultural remains as further chronological checks on prior investigations of Pueblo IV culture by Doctors Kidder and Nelson. The work was confined to the southwest quarter of the H-shaped ruin. Eighty ground floor and three interesting and unique subterranean rooms, incorporating certain features common to kiva construction, were cleared. Numerous test trenches were dug to obtain stratified refuse, to outline the limits of the structure, and to determine the nature of shallow depressions about the building. No kiva of the usual variety was located.

The Archaeological Survey of the Laboratory, under H. P. Mera, made a brief excursion during August to the upper Gobernador Canyon district to investigate finds reported from that vicinity. In September, the survey was first carried to the territory drained by the headwaters of both the Rio Puerco of the East, and Canyon Largo, the latter a southern tributary of the San Juan River, and later in the same month to the valley of the Rio Colorado, Valencia County, which was also explored archaeologically. These trips furnished the necessary evidence to complete a paper on the prehistory of the north central Rio Grande cultural area.

Through coöperative arrangement with Director Gladwin of Gila Pueblo, the services of Dr. Emil Haury, Assistant Director, were secured to conduct the Laboratory Training Course in Archaeological Field Method for six holders of Laboratory scholarships. The ruins selected are situated on the east bank of the Mimbres River, at Mimbres. Exploratory trenching established the location of the pit-houses of this large site. During the nine-week season, 33 structures were uncovered, averaging 5 feet in depth, the largest approximately 30 by 40 feet in size. Several burials accompanied by pottery were found. The site represents an early phase of Mimbres culture, perhaps the earliest to be investigated in this area. Erik K. Reed and Deric Nusbaum were directly employed by Gila Pueblo to assist Dr. Haury in the 1934 summer program.

Jesse L. Nusbaum,
Laboratory of Anthropology

The Logan Museum of Beloit College, Wisconsin, conducted an archaeological project near the village of Reserve during July and August. Several small ruins of Pueblo III period were excavated, in

which evidences of the Mogollon-Gila culture were found. A highly specialized form of pottery decoration consisting of exterior incisions occurred in large numbers on the sherds. At the close of the excavations, the field party visited the major ruins of Pueblo III age in the Southwest.

Paul H. Nesbitt,
Logan Museum, Beloit College

Gila Pueblo conducted excavations at the Harris site in the Mimbres Valley during the summer of 1934, under the direction of Dr. Emil W. Haury, assisted by the scholarship students of the Laboratory of Anthropology. The general survey of the Southwest, undertaken by Gila Pueblo, was extended to cover the area south of Zuñi and the region around Gallup. The work was conducted by Russell Hastings, a member of the staff.

Harold S. Gladwin,
Gila Pueblo, Globe, Arizona

The Archaeological Survey of the High Western Plains conducted by the Department of Anthropology of the University of Denver for the past five seasons, under the direction of Dr. E. B. Renaud, extended its activity into northeastern New Mexico in June and early July. The territory explored is located between U. S. Highway 85 from Raton to Las Vegas and the Sangre de Cristo Mountains to the west; and the districts southeast and southwest of Las Vegas to Bernal and Las Torres. Forty-five sites were visited, including camp sites, some very extensive and rich in artifacts, several rock shelters, work shops, mesa top look-outs, and three locations with numerous pictographs. Plains pottery, both stamped and plain, Apache sherds, and fragments of painted Pueblo pots were found in association at several sites, suggesting cultural contacts. A collection of artifacts was obtained for study in the laboratory. In August, Dr. Renaud and a class of a dozen students studied petroglyphs at two sites near Taos, one in the lower section of the Rio Grande Canyon, a site two miles long at Cieneguilla, one at Hagan, and one in the Galisteo Basin. This was the second season of the survey of pictographs in that region of New Mexico.

E. B. Renaud,
University of Denver

The University Museum and the Academy of Natural Sciences, both of Philadelphia, together with the Carnegie Institution of Washington, continued the work previously carried on in New Mexico attempting to

solve the problem connected with the people who apparently lived in that region during early post-glacial times. The work in 1934, however, was largely of a geologic nature although part of the time was spent in an unfinished excavation of a cave near the point of the Guadalupe Mountains, from which several infant cradle-burials were removed. Several feet below these, a layer of dung was encountered, apparently that of the ground sloth, although definite identification is waiting upon microscopic examination. The small trench which revealed this layer showed no association with human remains unless a large pine log, burned at one end and extending in and below the dung layer, is possibly due to man's presence there contemporaneous with the sloth.

Edgar B. Howard,
The University Museum, Philadelphia

New York. The 1934 season was an active and profitable one for the Rochester Museum of Arts and Sciences. With a force of seven men, under the supervision of William A. Ritchie, work was begun in May on a late Algonkin village site near Canandaigua and continued until the latter part of August. Several thousand bone, stone, and pottery specimens, and two extensive cemeteries were found, adding much to the knowledge of this phase of the prehistoric occupation of New York. The party then examined three small prehistoric Iroquois burial sites in the Western Finger Lakes region, from which valuable skeletal material was recovered. Late in September, after completing the excavation of an Algonkin site in the upper Genesse Valley, a highly interesting discovery was made 25 miles south of Rochester, on a Seneca village site of early contact age (*c.* 1630 A.D.). The cemetery on this site, which had escaped detection by collectors and expeditions from four museums during the past 50 years, was located by the Museum party and 80 burials uncovered. Some 30 pottery vessels, many fine pipes, bone implements, and ornaments accompanied the skeletons. These provide an important link in the association of some of the major Seneca village sites in western New York.

Arthur C. Parker,
Rochester Museum of Arts and Sciences

Mr. and Mrs. Charles F. Goddard, assisted by Mr. Latham, spent September and October in completing the excavation, begun in 1933, of the Conkling site on Wilson Creek, Aquebogue, Long Island, for the Long Island Chapter, New York State Archaeological Association.

Thirty-five large shell pits were examined and much interesting material recovered, including five more restorable pots. The pottery here is of peculiar interest because of its variety. One jar has vertical sides and rim rising from a round bottom and is, so far as the writer knows, unique for this district. In general, the Wilson Creek remains exhibit a strong early Algonkin culture slightly modified by Iroquois traits in the pottery. Messrs. Booth and Griswold continued work on the Emerson site at South Harbor, Southold, and partially excavated a small camp site at Nassau Point, Cutchogue, L. I., securing typical bone and stone implements, and good examples of Algonkin pottery.

Charles F. Goddard,
Long Island Chapter
New York State Archaeological
Association

North Carolina. Under the direction of W. B. Colburn and Jesse D. Jennings, a very interesting site in southwestern North Carolina was excavated near the present city of Murphy. The work was made possible by the F.E.R.A. as a Civil Works project. A large mound has been identified as marking the ancient town of Guasili, visited by Hernando De Soto in 1540. This site, at the junction of Peachtree Creek and the Hiwassee River, was described, at the time of De Soto's visit, as a town of 600 wooden houses—probably an exaggeration—and the capital of a province where the hungry explorers were given a hearty welcome and feasted upon dog meat. They caught and cooked some of the Indian dogs, to the amazement of the natives, who never ate these animals. One of De Soto's men wrote: "The lord who bore the name of the province left the capital half a league to meet the Spaniards, accompanied by 500 of the principal persons of the country, very gayly dressed after their fashion. His lodge was upon a mound with a terrace round it, where six men could promenade abreast." This site or mound has been definitely located by Dr. John R. Swanton from its peculiar geographical location, and checks with the description given by the early Spanish chroniclers as that of Guasili.

M. W. Stirling,
Bureau of American Ethnology
Smithsonian Institution

The Archaeological Society of North Carolina was unable to sponsor any excavation during 1934 because of lack of funds. Individual members, however, have continued a systematic study of archaeological

remains in several areas, among these being Mr. Burnham S. Colburn in the extreme western part of the state; Mr. Douglas L. Rights in the upper Yadkin valley; Mr. Joffre L. Coe in Guilford and Transylvania counties; and Mr. Guy B. Johnson in the New Hope Creek section of Orange and Durham counties. A beginning has been made on a survey of the state, but has been restricted because of lack of financial assistance.

Guy B. Johnson,
Archaeological Society of
North Carolina

North Dakota. The State Historical Society of North Dakota, assisted by C.C.C. labor, worked on two old Mandan sites in 1934. A large amount of excellent material was obtained, as well as other valuable data, since we have entirely uncovered four house sites, three in one village, and the fourth in the other. We hope to excavate about nine more lodges in the latter site. On each excavated site, a new earth lodge is being built. One of the most interesting pottery features was the design of a turtle formed by two rim sherds.

George F. Will,
State Historical Society of
North Dakota

Ohio. Field work of the Ohio State Archaeological and Historical Society during 1934 was limited to four projects. Excavation of the wall of the gateways at the south end of Spruce Hill in Ross County revealed quantities of "slag" apparently resulting from an intense fire which reduced the earth forming the roof and sides of some sort of log structure to glass, in some instances. Three days were spent at Newcomerstown, in Tuscarawas County, where workmen digging for a gas main had encountered a historic Indian cemetery, probably Delaware. Several burials exposed by the trench were removed, and with some of them were a silver arm band, arrow-points, and peach pits. Since the latter were found with more than one burial, it is probable that they represent intentional placements. This cemetery is dated historically from 1772 to 1790. A day was spent in excavating a peculiar pit on the farm of Tom Porter in Ross County. It was clay-lined, showing signs of fire, and the bottom was on an incline, coming to the surface at one end. It contained no artifacts. Excavations near White Cottage in Muskingum County in what was believed to be the second largest

Hopewell type of mound in Ohio revealed this mound to be what the geologists call a "hill of circumdenudation." This had been known as the Spillman Mound, and a photograph sent to the Ohio State Museum in 1914 led to the examination.

E. F. Greenman,
Ohio State Archaeological and
Historical Society

Oregon. Archaeological research was carried on by Herbert W. Krieger, Curator of Ethnology in the U. S. National Museum, in the Columbia River Gorge area to be flooded by the Bonneville Dam. Numerous sites were excavated through an allotment by the P.W.A. to the Bureau of Indian Affairs, which requested the Smithsonian Institution to loan one of its staff members to direct the undertaking. This work, lasting six months, yielded a considerable amount of archaeological material, and included a survey of ancient and historic Indian village sites.

Walter Hough,
U. S. National Museum

A party of six, four from the University of Oregon and two from Stanford University, spent a month on an archaeological survey of the Guano Valley area. The expedition was jointly financed by the two institutions and was directed by Dr. L. S. Cressman, of the University of Oregon. Guano Valley is one of the great faults in south central and southeastern Oregon. Abundant evidence of aboriginal habitation is found there and in the high tableland to the west. The area, as was suggested by earlier studies of petroglyphs, seemed to lie in the northern periphery of the Southwest area. The summer's work added further evidence of this. With one exception, all the sites appeared to be summer camps. One cave at Guano Lake was excavated. It was small, but showed evidence of long occupation, yielding shredded sage brush bark, fragments of twined basketry, stone and bone implements. Reconnaissance trips located other sites for future investigation. At one, a Folsom point was found, and some distance away in the same general area, in a cave or overhang, a potsherd was found. The sherd, according to Dr. J. H. Steward, resembles the type from Promontory Point Cave except for its tempering. It is planned to excavate this cave in 1935.

A grant from the Carnegie Institution made possible the careful

examination of a site near Bonham Falls. In September, Dr. Cressman examined two knives found by workmen for the U. S. Bureau of Reclamation in a test pit on the Wikiup Dam site. These knives, or scrapers, were found in the Deschutes National Forest at a depth of five feet. Under the humus was a stratum of pumice extending down two feet, and this was followed by a stratum of fine yellow soil mixed with gravel. The knives were found under this last and on top of a stratum of cemented gravel. No other artifacts or fossils were found. A third knife, broken, was lost by the workmen. There did not appear to be any possibility of their having been placed there by digging or of having worked down through the soil. Dr. Spencer, of the U. S. Geological Survey, estimates the deposit in which the knives lay as late glacial. This needs verification by further archaeological investigation.

L. S. Cressman,
University of Oregon

Pennsylvania. During July, 1934, active field work was started in the western part of the state by the Pennsylvania Historical Commission. A special effort was made to establish archaeological "key" stations and obtain a cultural horizon for the region. Several sites were investigated in southwestern Erie County, and six boulder mounds containing cremations were recorded. On the outskirts of Erie, a site that will be destroyed by road building was partially explored. Six pottery vessels and many objects of copper, bone, and shell were recovered. Twenty sites were checked in Crawford County, and one "key" station established on the edge of the Pymatuning Swamp. Here a large palisaded fort was uncovered and charted. Its culture was determined as Iroquoian from the pottery and other remains. Archaeological information in the files of the Commission was checked in Mercer, Venango, Lawrence, and Butler counties. Several sites were investigated in Allegheny, Fayette, and Somerset counties. A "key" station was established in the latter county, where field work was concluded in November.

Donald A. Cadzow,
Pennsylvania State Historical
Commission

Several members of the Society for Pennsylvania Archaeology carried on field work during 1934. Dr. T. B. Stewart, of Lock Haven, excavated an undisturbed site of prehistoric culture containing both

circular and long pits. Considerable pottery was found in the pits, together with stone artifacts and well preserved bird and animal bones. Mr. G. B. Fenstermaker worked in Lancaster County charting sites and recording information.

Frances Dorrance,
Society for Pennsylvania Archaeology

An archaeological expedition to Lancaster County, led by Samuel W. Pennypacker, II, under the auspices of the Museum of the American Indian, Heye Foundation, spent about three months investigating a site on the Schultz farm. Several skeletons and a number of pits were excavated. Nothing unusual was found, except for two fossil shark teeth drilled in two places for suspension as pendants.

George G. Heye,
Museum of the American Indian
Heye Foundation

Southeastern States. In November, Frank M. Setzler, Assistant Curator of Archaeology, U. S. National Museum, accompanied Dr. J. R. Swanton, of the Bureau of American Ethnology, on a reconnaissance through the southeastern states. Several sites supposed to have been visited by Hernando de Soto in 1539 were examined. Of these, Xuala near Walhalla, South Carolina; the crossing of the Tennessee River near Franklin, North Carolina; and Guasili, near Murphy, North Carolina, proved most significant from the archaeological point of view. Numerous archaeological sites in Georgia were also inspected. Near Panama City, Florida, Mr. Setzler obtained potsherds decorated in the Hopewell style. This, together with vessels obtained by C. B. Moore in 1902 on Alligator Bayou, St. Andrews Bay, Florida, would seem to establish distribution of this prehistoric, Mississippi Valley complex much farther east than the Marksville Hopewell site excavated by Setzler in 1933. Two clay platform type pipes, similar to those from Marksville, Louisiana, were obtained in northern Georgia.

Walter Hough,
U. S. National Museum

South Dakota. Short trips were made by Mr. W. H. Over, of the Archaeological Research Division of the University of South Dakota, to visit remains unearthed by private and relief workers. The most interesting discovery was a small mound on Twelve Mile Creek, Hutch-

inson County, where a fine clay vessel, many stone and flint implements, and shell ornaments were associated with skeletons. The material resembled that found in the Broken Kettle Creek site, Plymouth County, Iowa. The wind erosion caused by drouth conditions of 1934 exposed many thousands of flint implements in several counties where previous remains had been unknown. Local collectors have picked up most of these artifacts. Arrow-points and knives predominate, but a few pipes, and an occasional potsherd were found. About 40 per cent of the stone material in Davison County was dark brown translucent chalcedony from the Huron region. In the Gregory-Tripp region, a fair sprinkling of Arikara artifacts were included.

W. H. Over,
University of South Dakota

Tennessee. From December 21, 1933, to March 30, 1934, Dr. F. H. H. Roberts, Jr., assisted by Moreau B. Chambers, directed the Smithsonian Institution-C.W.A. project at Shiloh National Military Park, near Pittsburgh Landing. The site is on a high bluff above the west bank of the Tennessee River, and consists of seven large mounds—six domiciliary and one burial—and numerous low elevations which mark the places where dwellings once stood. To the west is an embankment extending across the neck of the bluff from one ravine to the other, indicating the former existence of a palisade.

M. W. Stirling,
Bureau of American Ethnology
Smithsonian Institution

Under the auspices of the Tennessee Valley Authority, an archaeological survey was conducted in the Norris Basin using C.W.A. and relief labor. Twenty-three sites were excavated and a large amount of material and information recovered from the region to be inundated on Clinch and Powell rivers by the building of the Norris Dam. During the same period, an archaeological survey of the Tennessee River in north Alabama was conducted in the region to be flooded by the building of the Wheeler Dam. Professor Wm. S. Webb, Archaeologist in Charge, directed both projects.

Wm. S. Webb,
Archaeologist in Charge
Tennessee Valley Authority

T. M. N. Lewis, of the department of archaeology, University of Tennessee, assisted by Charles G. Wilder, four foremen and a group of laborers, investigated a large mound and village site on an island in the French Broad River, near Dandridge. Postmold patterns of superimposed ceremonial structures within the mound have been traced. Their dimensions are approximately 35 by 35 feet. Five superimposed round altars in the center of the structure floors and five ramps leading up to these floors have been uncovered. The hard clay floors are pitted with burials, and nearly 250 have been encountered so far. An abundance of mortuary offerings accompanies the burials, placed in pits lined and covered with bark and split sections of birch logs, two feet long by four or five inches wide. The strips appear, in some instances, to have rounded ends, and to have been attached to bark, possibly serving the purpose of supporting cleats. The pits tend to be rectangular, and have been found all the way from several inches below the surface of the mound to a depth of 3½ feet below the hardpan. Wood specimens have been forwarded to Dr. Florence M. Hawley, of the University of New Mexico, for cross-dating with the master chart which has been worked out for this region. These dates should not only indicate the years in which the superimposed structures were built, but also the length of time intervening between each successive structure. The dating of the black walnut logs, recovered from several of the ramps, will enable them to be associated with the floors to which they led, and the dating of the birch strips covering the burial pits may also serve the purpose of dated tomb stones.

T. M. N. Lewis,
University of Tennessee

The East Tennessee Archaeological Society carried on a limited amount of field work in 1934, consisting of the examination of a prehistoric village site, five miles above Chattanooga on the Tennessee River, and the location and recording of additional village and camp sites.

Charles K. Peacock,
East Tennessee Archaeological Society

Texas. During the spring of 1934, A. T. Jackson explored the upper Nueces River in south central Texas for the University of Texas. He later excavated a half dozen extensive rock shelters which revealed material resembling that from the shelter in the Seminole Canyon near

the mouth of the Pecos River. One striking feature in both areas was the finding of skulls from which all molars had been extracted from the lower jaw early in life. No definite stratification was encountered in either region. The upper levels apparently represent the Lipan-Apache culture of historical times. In the summer Mr. Jackson explored the Red River from Bonham west to Wichita Falls. He found the Caddoan culture of east Texas spreading up this river in continuously attenuated form westward.

Walter Goldschmidt, of the Department of Anthropology, and a small expedition explored several sites during the summer, including one large mound which yielded only bits of sherd and bones, but no burials. At the bottom of this mound, some 20 feet below the top and on bedrock, were holes outlining the foundations of typical Caddo buildings, in soil indicative of a village site. Later he explored three burial sites in the same general region, from which many specimens of pottery, including some forms not previously encountered, were recovered. On the Sulphur River, he found intrusive burials of somewhat different culture from the older burials.

In the fall, Jackson explored several rock shelters in the characteristic sink holes of the high plains area in Culberson and Reeves counties to the east of the Guadalupe Mountains. He found abundant evidence of what we are now disposed to regard as a late Basket Maker culture. Dr. Pearce investigated an old gravel terrace on Brushy Creek near Round Rock, 20 miles north of Austin. Flint artifacts were found throughout a gravel bed some 18 feet deep, of possibly late Pleistocene age, according to geologists. Details of this discovery were reported in *Science* and *Science News Letter*. The artifacts from this site show stratification, but throughout the upper half, the type of flint work belongs to the upper level culture of the burnt rock mounds in Texas. In the lower portion of the gravel bed were types that might have come from the culture of the lower portions of the rock mounds. This site tends to confirm the opinion that the bottom levels of the large burnt rock middens may represent the first appearance of man in Central Texas.

J. E. Pearce,
University of Texas

In 1934, Floyd V. Studer, of the Panhandle-Plains Historical Society, excavated three large rooms and several circular rooms at Texas Panhandle Culture Ruin No. 55 in Potter County. Dr. C. Stuart Johnston, of the newly established Department of Archaeology at the

West Texas State Teachers College at Canyon, and his students visited and studied many sites during the last quarter. Several Folsom points were found near Dalhart, and one point was encountered in direct association with fossil mammoth remains in Roberts County.

Floyd V. Studer,
Panhandle-Plains Historical Society and
West Texas State Teachers College

The deeply buried, stratified camp sites of the Abilene region, discovered by Dr. Cyrus N. Ray in 1929–1930, and reported in the *Bulletin of the Texas Archeological and Paleontological Society*, were visited by E. B. Sayles, Dr. Ernst Antevs, Dr. Leighton, and others during the summer of 1934. The site is a vertical bank 30 feet high containing superimposed camp site debris strata at depths of 24½ and 27 feet below the present soil surface. During the summer, Dr. Ray discovered a new site containing ribs, a lower jaw, and a portion of the leg bone of a mammoth, and close above in the same geological formation, two worked flints. One was 18 inches above, and the other four feet from the bones. Mr. E. B. Sayles photographed the flints *in situ*, and a portion of the mammoth jaw was excavated. Dr. E. H. Sellards, of the Geology Department of the University of Texas, visited this site in the fall and the remainder of the jaw was removed to the University Museum. This site is located 30 miles southeast of Abilene on a branch of Pecan Bayeau Creek. Dr. Sellards also visited two high terrace camp site strata wherein mineralized horse bones had been found, and the Elm Creek site reported in the Society's Bulletin, making more detailed studies of the geological features.

Cyrus N. Ray
Texas Archeological and
Paleontological Society

During 1934, the West Texas Historical and Scientific Society excavated a dry rock shelter, known as "Dead Cow" Cave, in the Sunny Glen group. A large amount of flint implements, a baby cradle similar to the one reported from the Valentine area by Setzler, additional evidence of the characteristic split-stitch basketry of the Big Bend, a new type of loose matting, and the usual run of dry shelter evidence were secured. Five additional sites were added to the archaeological survey of the Big Bend.

Victor J. Smith,
West Texas Historical and
Scientific Society

In October and November, surveys of several camp sites, trails, and sand hills in the vicinity of Lubbock were made under the auspices of the Southwest Texas Archaeological Society. A number of fireplaces were excavated. A preliminary survey of the north bank of the Rio Grande at Piedras Canyon was made by Major Fletcher Gardner, U.S.A. retired, at the mouth of the Arroyo de los Morteros, 128 miles above Brownsville, Texas. Sixteen metate holes, apparently of Basket Maker I were discovered, and many artifacts identical with those secured from cave shelters on the Rio Grande and Pecos. This locality is about 350 miles southeast of the last previously known Basket Maker territory. It is hoped that this discovery may bring the canyons of the Salado, San Juan, and Alamo into a proven Basket Maker area. A number of campsites were located in Lopena and Zapata counties in an interesting geological formation of fossil oyster shells mixed with coarse green marl, gravel and boulders, and a 10-foot layer of sandy clay. There are three distinct camp deposits, two below the surface and one on the surface, separated by about 18 inches of sterile soil. The sites below the surface contained only triangular points, while the surface sites have the small V-based coastal points and the heavy barbed points of the Lipan. In some of the ravines were found points similar to Basket Maker ones. A large number of artifacts were recovered from surface sites. These included about 200 complete points, the majority triangular, 12 hand hatchets of smooth flint stone, two chipped flint hatchets, two sandstone arrowsmoothers, and four flint drills. All forms of scrapers were found. One potsherd, of light-gray ware with a white slip, was found on the surface.

Fletcher Gardner,
Southwest Texas Archaeological Society

Gila Pueblo, of Globe, Arizona, conducted investigations in Texas east of Abilene. This work was directed by E. B. Sayles, and was a preliminary survey to determine sites which may later warrant excavation with a view to increasing our knowledge of early man in Texas.

Harold S. Gladwin,
Gila Pueblo, Globe

Utah. Archaeological investigations by the National Park Service to determine the types, location, and number of sites in Zion National Park were carried on from December 28, 1933, to April 23, 1934, and from August 4 to September 25. Forty-four sites were located and

recorded in the Park and immediate vicinity. Test excavations were made on five sites for data on general outlines, house features, and datable beam material. Thirty-nine samples of wood were taken to Mr. John C. McGregor, of the Museum of Northern Arizona, for dating. In addition, comparative studies have been made of 45 sites in the Kanab and Mt. Trumbull quadrangles in Arizona; St. Thomas quadrangle in Nevada; St. George, Kanab, and Beaver quadrangles in Utah. The work was in direct charge of Ben W. Wetherill, assisted by Mr. Elmer R. Smith during the first part. The Zion National Park archaeological project was recommended and administered by Mr. P. P. Patraw, Superintendent of Zion and Bryce Canyon National Parks, and by Mr. C. C. Presnall, Park Naturalist. Dr. Harold S. Colton and Mr. Lyndon L. Hargrave, of the Museum of Northern Arizona, have given invaluable advice.

Ben W. Wetherill,
Zion National Park
National Park Service

Under a permit from the Secretary of the Interior, Albert B. Reagan, then of the U. S. Indian Service, continued archaeological work in the Uintah Basin during May and June, 1934, principally in Hill and Willow Creek Canyons, south of Ouray. On July 1, he became Special Professor of Anthropology at Brigham Young University and his permit was transferred to that institution. Groups of pictographs and petroglyphs were examined east of Green River to Desolation Canyon; in Nine Mile Canyon, east of Price; at Lincoln Beach, southwest of Utah Lake; at Santaquin, near Goshen; in the vicinity of Cedar Fort; and in Red Cut, five miles west of Fairfield. A total of 101 groups were photographed, and some were drawn as well. Many of the Green River pictographs were recent Ute; the Nine Mile Canyon "writings" were mostly Puebloan; while the rest are tentatively placed as Basket Maker II. The excavation of a cave near the Myrup place in the Hill-Willow Creek region yielded several baskets of the Basket Maker type. Reconnaissance work disclosed that Provo was partly built on ancient mound sites, and that a series of mounds extended along Provo River to Utah Lake, and then southeast along a former channel of that river to the Marian Hinkley and Jacobson properties. The sites of more than 40 mounds were located in this vicinity, ranging from 60 to 128 feet in diameter, and from 8 to 12 feet high before they were leveled by the plow. A few still remain undisturbed. There are also many camp sites

in the region. One, covering several acres, has been exposed by the receding lake in the last few years, showing that there had formerly been a drouth which had drained the lake to its 1934 level. This drouth must have continued for a number of years, as innumerable artifacts are exposed on the site, including lower jaws and other bones of the buffalo (*Bison bison*). Excavation of the Meriett mound, southwest of Provo, revealed walls, rooms, and pottery of the proto-Kayenta type, besides the ordinary gray undecorated pottery of the region. There were also a few corrugated sherds, indicating occupation toward the close of Pueblo II. The debris for about two feet above the Pueblo remains bore artifacts of an undetermined age and people. The upper two feet contained camp site material, probably of Ute occupation, since the mound, with the other mounds of the section, was then a landing place during the time the lake was at a high stage. The Benson Mound, southwest of the Meriett Mound, yielded wall indications in the lower strata, and a skeleton with the cradleboard-flattened head of the Pueblo type. Excavation showed that a mud-and-daub house had been erected on the eastern margin and later burned as indicated by the brick-like roof and side-wall clay chunks. This latter building was erected after the Pueblo solid-walled house had been abandoned. A skeleton was exhumed 10 feet east of this mound, which had a dolichocephalic skull, a noticeably thick brain case, and somewhat unusual supraorbital development. It apparently resembles a skull cap obtained from the nearby lake front, and described by Dr. George H. Hansen in the *American Anthropologist*, n.s. Vol. 36, 1934, p. 431. The Pueblo dwellings of this region are of two types, the Willard-Grantsville type of jacal pole, mud-and-daub structure; and the solid-walled house leading to the George-Bradshaw, Beaver type of structure.

Albert B. Reagan,
U. S. Indian Field Service and
Brigham Young University

Vermont. An expedition sponsored by the Museum of the American Indian, Heye Foundation, under the direction of Godfrey J. Olsen, excavated a burial and village site opposite Fort Ticonderoga in Addison County. Seventeen skeletons and a number of pits were uncovered. With one exception, all the burials were accompanied by artifacts. Stone tubes and unbaked clay ones ranging from 3 to 15 inches long were found, inside of which, near the end with a small perforation, were found small pottery plugs. Some of the more common stone implements

and pottery of the early Algonkin tribes, a number of copper beads and tools, including a copper celt with the remains of a wooden handle, and several slate boatstones of unusual type were also recovered. One of the latter had a circular top, and another, a groove along the top.

George G. Heye,
Museum of the American Indian
Heye Foundation

Wisconsin. Members of the Wisconsin Archeological Society, under the direction of its survey chairman and secretary, have engaged in field work in some 20 Wisconsin counties. Reports of this work have been filed with the state. In coöperation with the Society, the State Historical Museum has continued its survey of the Rock River region, completing this work in the sectors extending from Jefferson to Johnson's Creek, and from the latter town to Watertown. A number of camp and village sites, mounds, cemeteries, and burial places were located, examined and reported upon. Survey work was also done in the Sugar River region. A group of mounds, located in the University of Wisconsin Arboretum, was repaired and restored. Two effigy mounds were excavated; three other mounds in the vicinity of Madison, and a burial pit at Algoma were investigated.

Charles E. Brown,
Wisconsin Archeological Society and
State Historical Museum

Organization	*State*
Academy of Natural Sciences of Philadelphia	New Mexico
Alabama Anthropological Society	Alabama
Alabama Museum of Natural History	Alabama, Arkansas
Alaska Agricultural College and School of Mines	Alaska
American Museum of Natural History	Canada (Labrador)
Archaeological Society of Delaware	Delaware
Archaeological Society of New Jersey	New Jersey
Archaeological Society of North Carolina	North Carolina
Arizona State Museum	Arizona
Birmingham Anthropological Society	Alabama
Brigham Young University	Utah
Bureau of American Ethnology	California, Colorado, Florida, Georgia, Mississippi, North Carolina, Southeastern States, Tennessee

Carnegie Institution of Washington	Colorado, Nevada, New Mexico, Oregon
Department of the Interior	Alaska
East Tennessee Archaeological Society	Tennessee
Field Museum of Natural History	Colorado
Gila Pueblo, Globe	Arizona, New Mexico, Texas
Government Relief Agencies (includes C.C.C., E.R.A., C.W.A., P.W.A. assistance)	Alabama, Arizona, California, Colorado, Delaware, Florida, Georgia, Iowa, Louisiana, Mississippi, Missouri, Nevada, New Mexico, North Carolina, North Dakota, Oregon, and Tennessee
Indiana Historical Society	Indiana
Laboratory of Anthropology	Arizona, New Mexico
Logan Museum, Beloit	New Mexico
Long Island Chapter, New York State Archaeological Association	New York
Louisiana State University	Louisiana
Mississippi Department of Archives and History	Mississippi
Montana State School of Mines	Montana
Museum of the American Indian, Heye Foundation	Pennsylvania, Vermont
Museum of New Mexico	New Mexico
Museum of Northern Arizona	Arizona
National Museum of Canada	Canada (British Columbia)
National Park Service	Arizona, Colorado, Nevada, Utah
Nebraska State Historical Society	Nebraska
Ohio State Archaeological and Historical Society	Ohio
Panhandle-Plains Historical Society	Texas
Pennsylvania State Historical Commission	Pennsylvania
Rochester Museum of Arts and Sciences	New York
Sacramento Junior College	California
San Diego Museum	California
School of American Research	New Mexico
Society for Georgia Archaeology	Georgia
Society for Pennsylvania Archaeology	Pennsylvania
Southwest Museum	California, Nevada
Southwest Texas Archaeological Society	Texas
State Historical Museum of Wisconsin	Wisconsin

State Historical Society of Iowa	Iowa
State Historical Society of North Dakota	North Dakota
Stanford University	Oregon
Tennessee Valley Authority	Alabama, Tennessee
Texas Archeological and Paleontological Society	Texas
U. S. Indian Field Service	Utah
U. S. National Museum	Alaska, Louisiana, Oregon, Southeastern States.
University Museum, Philadelphia	New Mexico
University of Arizona	Arizona
University of Arkansas	Arkansas
University of Chicago	Illinois
University of Denver	New Mexico
University of Kentucky	Kentucky
University of Michigan	Michigan
University of Minnesota	Minnesota
University of Missouri	Missouri
University of Montana	Montana
University of Nebraska	Nebraska
University of New Mexico	New Mexico
University of Oregon	Oregon
University of South Dakota	South Dakota
University of Tennessee	Tennessee
University of Texas	Texas
West Texas Historical and Scientific Society	Texas
West Texas State Teachers College	Texas
Wisconsin Archeological Society	Wisconsin

Carl E. Guthe, Chairman
Committee on State Archaeological Surveys

THE SOCIETY FOR AMERICAN ARCHAEOLOGY
ORGANIZATION MEETING

THE organization meeting of the Society for American Archaeology was held on December 28, 1934, at the Hotel Roosevelt, Pittsburgh, Pennsylvania, following the annual subscription dinner of Section H, A.A.A.S. The meeting was called to order at 10 P.M. by Dr. Carl E. Guthe after a short paper had been presented by Mr. Melville Sayre, of the State School of Mines, Butte, Montana. Dr. Guthe outlined the organization of the proposed Society and distributed mimeographed copies of the constitution and by-laws prepared by a special committee.

Dr. Guthe: In 1921, the National Research Council created the Committee on State Archaeological Surveys. Its immediate purpose was to stimulate a greater scientific interest in local archaeology in a few Middle Western states. It soon became apparent that if this Committee was to act in an advisory capacity for these few states, information on techniques, methods, accomplishments, and experiences had to be accumulated in the Committee office. In a few years, the Committee became a clearing house and advisory center for North American archaeology. Later the Carnegie Corporation furnished much needed financial support under which the Committee has been working for the past five years, and through which most of its accomplishments have been made possible. In the last few years the general public has been taking a greater interest in American archaeology and its problems. Many scientists working in other disciplines—history, geology, astronomy, and botany, for example—have become concerned with archaeology and are anxious to help the professional. Non-professional students in all walks of life have increased in number. The ubiquitous relic-hunter has become more active and therefore more dangerous than before. At present, no adequate mechanism exists by which these semi-trained and interested individuals can be reached.

The Committee attempted to meet this situation by selecting men in different states to bring together those studying local archaeology. Coöperation with local societies was fostered. Most of those present are familiar with the means the Committee has used to bring about a greater appreciation of scientific standards in archaeology. Yet the Committee has three shortcomings. First, it is not a permanent organization. It has, however, rendered a number of services which American archaeologists want continued. But it is too much to expect these services to be continued indefinitely under the support of the Founda-

tion. It is necessary to reorganize the Committee on a permanent basis. Second, the individuals interested in the work of the Committee at present have no direct voice in creating its policies. If the Committee is to function as it should, it must represent the opinions of those who benefit by its work. Some method should be developed by which professional and non-professional students of American archaeology can express themselves through an organization. Third, there is a large body of non-professional students whom we cannot reach at the present time. They are becoming self-conscious and organizing societies for collecting relics. It is high time that the professional American archaeologist should offer assistance to the non-professional who wants to help the science. We can profit by the experience of ornithologists and astronomers in using the interest of laymen to secure certain types of information. A national organization is one means of reaching the non-professional student.

These considerations gave rise to the concept of a national organization, in the summer of 1933. At the meeting of the American Anthropological Association in Columbus in 1934, a group of archaeologists spent one evening discussing the situation and preparing a preliminary program. In the spring of 1934, the Committee sent out to about two hundred people on its mailing list, a prospectus of the suggested Society with a request for comments and criticisms. I am happy to report that with two or three exceptions, there was immediate and enthusiastic approval of the scheme. Since then I have received strong statements of support from individuals in other fields of anthropology and in other sciences. The prospectus was then re-written in order to take advantage of the criticisms and suggestions which came in. This fall a ballot was sent to individuals on the mailing list, asking them to elect a committee on constitution and by-laws for the Society to be presented at this meeting. The committee consisted of Doctors A. V. Kidder, A. L. Kroeber, and F. H. H. Roberts, Jr. The constitution and by-laws, as drawn up by this committee, have been distributed in mimeographed form to most of those directly interested in the organization of this Society.

There are several points which should be emphasized. We are attempting to create a mechanism by which those anthropologists using the archaeological method may be brought into closer contact with the public interest in our work. We are not attempting to isolate ourselves as American archaeologists. We are attempting to create a wider appreciation of the methods and principles of scientific research.

We have no intention of lowering the standards of professional archaeological research. Vandalism and destruction, in most cases, are the result of well-intentioned ignorance.

Dr. Moorehead: You refer to non-professionals, and the professionals helping them. It is often difficult to distinguish between these two classes. There are many men who began as non-professionals and who have done excellent scientific work in the field, such as George Will, Dorsey, Parker, Moore, Wilson, and others.

Dr. Cole: A large number of people are interested in securing more information about archaeology. I suggested a year ago that I thought a mailing list could be secured if we placed in the Maya Temple at the Century of Progress a book to be signed by people especially interested in archaeology and anthropology. Dr. Guthe agreed that it might be a good plan. I put the book there thinking two or three pages might be filled. There were attendants to talk to people and ascertain whether they were really interested, or just casually curious. The book has now eight volumes. I have here about 7,000 names and addresses of people who have expressed a considerable interest in American archaeology. It gives me great pleasure to place it at Dr. Guthe's disposal.

Dr. Spinden: I appreciate the work accomplished for years by the Committee on State Archaeological Surveys. Yet, I think the American people are the most unself-disciplined in the world. The encouragement of this interest in archaeology is like putting kerosene on the fire. In Guatemala City there is a society of one hundred and fifty people interested in archaeology. They went by train to Quirigua. I have a statistical statement of the number of pieces broken off monuments during this excursion. Nineteen pieces were chipped off one stela alone. Every single monument was mutilated. I talked with the secretary of this "scientific society" about the destruction, and he said it was the result of a discussion in which some people declared the monuments were not carved out of stone, but were cast from cement. The mutilation was the method chosen to decide which opinion was correct. In America the museums have no control over the layman. I have heard that certain schools have laboratory courses for student archaeologists, and go out and destroy mounds and sites for the experience. (Dr. Spinden elaborated upon his adverse opinion, and suggested that the only way to preserve antiquities in the United States was to put into practice the law of treasure-trove as it is used in the Latin American countries.)

Dr. Krogman remarked that he felt there might possibly be some

difference in the attitude of the peoples of the two areas under discussion, particularly regarding a population which couldn't tell the difference between stone and cement. He added that Boy Scout troops in Ohio have called the attention of the staff of Western Reserve to evidences of Indian occupation and asked for scientific assistance.

Dr. Linton: It seems to me that the turning loose of fledglings under competent control is very much better than exerting no control at all. In the Middle West, the work of students in training has been very efficient. Moreover, Sunday visitors come to the diggings and are thoroughly discouraged from trying any digging when they see the hard work involved and the lack of spectacular remains in the form of beautiful pottery or gold ornaments.

Dr. Spier: I feel that in part some of what has been said is not really cogent to the present discussion. It is proposed here that the professional archaeologists organize themselves as a going concern. They hope to induce reasonably serious non-professional archaeologists to join them. That is the question that has been discussed. Do we here as professional archaeologists wish to affiliate ourselves to further the profession of archaeology?

Dr. Cole: There are many, many people all over the country who are digging and destroying evidence, not because they want to be vandals, but because they do not know any better. When interest is stimulated along the right lines, a large proportion of vandalism stops. There is one case in point in northern Illinois; of 655 mounds in one county, over 600 had been dug into at the time we started our survey. While working in this county, we always invited people to come in to see what we were doing. Now a large number of residents who formerly allowed digging on their land have stopped giving such permission.

Dr. O. W. Junek moved that the constitution and by-laws of the proposed new Society be accepted. Dr. Spier seconded the motion. It was passed.

Dr. Guthe: I assume such a motion includes the creation of the Society, those of us here acting as agents for the majority of archaeologists. I shall ask those who wish to do so to sign the paper I shall pass around, as a record of this organization meeting. The next order of business is that of creating a group of officials of the Society—the council and officers. I took it upon myself to talk this matter over with a number of men in order to eliminate, as far as possible, unnecessary delay. The nominating group assisting me consisted of Doctors Cole, Jenks, and Linton. We have taken the liberty of preparing a slate for

presentation at this meeting. The officers and members of the Council must be eligible as Fellows, i.e., they must be members who are competent archaeologists, and who have the respect and esteem of the entire personnel. The president must be actively interested in archaeology and in furthering the objectives of the Society. The slate of nominations is as follows: A. C. Parker, Rochester Museum of Arts and Sciences, New York, for President; M. R. Harrington, Southwest Museum, Los Angeles, for Vice-President; W. C. McKern, Milwaukee Public Museum, for Editor; and Carl E. Guthe, chairman of the Committee on State Archaeological Surveys, for Secretary-Treasurer; Council members, E. F. Greenman, E. W. Haury, D. Jenness, F. H. H. Roberts, Jr., Leslie Spier, W. D. Strong, G. C. Vaillant, and Wm. S. Webb. Are there any suggestions or nominations from the floor?

Dr. Cole moved that the report of the nominating committee be adopted. The motion was seconded and carried. Dr. Guthe was asked to notify the officers of their election.

Dr. Spier: When this proposition was brought to my attention, there was a suggestion that it might become a separatist movement. The feeling is very general both on the part of archaeologists and individuals in other branches of anthropology that this organization should be effected. One of the best instances of this feeling is the presence of a number of individuals from other fields of anthropology here this evening. I had this point seriously in mind when I encouraged Dr. Guthe to go forward with his plan. We are both anthropologists, but as archaeologists we are interested in a special field. At this time we are laying down the policies that will determine the trends of the future organization. We hope there will be no separatist movement away from the other allied organizations of the country. As editor of the *American Anthropologist*, I have given some thought to the problem of publication. I have been asked what will happen to the *American Anthropologist* if we no longer have archaeological articles. But articles of broad scope and vision in archaeology will still be welcome in the *Anthropologist*. As I see the situation, it is highly analogous to the situation in folk lore, linguistics, physical anthropology, and ethnology. Articles on special interests should properly be placed where they will be able to reach the largest personnel. We hope that we will continue to have in the *American Anthropologist* articles in the field of American archaeology which should be brought to the attention of other anthropologists who turn to its pages to see what is going on in the anthropological world. A separatist movement would be very unfortunate. That

is a matter for our determination. I believe it can be very nicely adjusted.

Following some closing remarks by Dr. Guthe, a motion for adjournment was entertained. The meeting adjourned *sine die* at 11 P.M.

List of persons who signed the constitution:

T. M. N. Lewis
E. F. Greenman
Sallie Wagner
A. E. Jenks
Paul H. Nesbitt
H. Melville Sayre
Herbert J. Spinden
Ellen S. Spinden
James B. Griffin
William A. Ritchie
Richard S. Morgan
D. S. Davidson
Alexander Lesser
Carl E. Guthe
Cornelius Osgood
Warren King Moorehead
Thorne Deuel
Helen H. Roberts
Glenn A. Black
Volney H. Jones
Melville J. Herskovits
Rev. Joseph G. Doherty, S.J.
Ralph Linton
Fay-Cooper Cole
O. W. Junek
Leslie Spier
Wilton Marion Krogman
Gene Weltfish
Emma Reh
Dorothy L. Schulte
Dr. John M. Cooper

THE CONSTITUTION OF THE SOCIETY FOR AMERICAN ARCHAEOLOGY

ARTICLE 1.—OBJECTS

The objects of the Society are to stimulate scientific research in the archaeology of the New World by: creating closer professional relations among archaeologists and between them and others interested in American archaeology; guiding, on request, the research work of amateurs; advocating the conservation of archaeological data and furthering the control or elimination of commercialization of archaeological objects; and promoting a more rational public appreciation of the aims and limitations of archaeological research.

ARTICLE 2.—MEMBERSHIP

Persons willing to coöperate in furthering the objects of the Society may be elected Affiliates. Affiliates who have engaged in scientific research in American archaeology, and who have published upon their research in recognized scientific media may be elected Fellows. Affiliates and Fellows shall have equal voting privileges at business meetings of the Society and of its Divisions, and receive all publications of the Society. Institutions desiring to subscribe to the Society's publications for their library files may be elected Institutional Members. The annual dues shall be three dollars. An Affiliate or Fellow who pays at one time

the sum of fifty dollars to the Society becomes a Life Affiliate or Fellow and shall be exempt from further dues.

Article 3.—Officers

The officers of the Society shall be elected at the annual meeting from among the Fellows, and shall consist of a President, a Vice-President, a Secretary-Treasurer, and an Editor. The President and Vice-President shall be elected for one year, the other officers for four years. The officers shall perform the usual duties of these offices, under the direction of the Council. Further, the Secretary-Treasurer shall act as a clearing house and advisory center on archaeological matters for the benefit of the Society and its membership.

Article 4.—Council

The Council shall consist of the President, the Vice-President, the Secretary-Treasurer, the Editor, and eight Fellows, two elected at each annual meeting for a term of four years. The Executive Committee of the Council shall consist of the four above-named officers. The Council shall appoint such standing or temporary committees as it deems desirable.

Article 5.—Divisions

Regional Divisions of the Society may be formed by vote of the Council. Such Divisions may elect officers, hold meetings, appoint committees, enter into relations with other societies and promote within their fields the objects of the Society. The presiding officer of each of such Regional Divisions shall be a Fellow of the Society.

Article 6.—Meetings

The Society shall hold an annual meeting at a time and place to be determined by the Council. Other meetings of the Society, including regional meetings where Divisions do not exist, may be authorized by the Council. Divisions may hold annual and other meetings.

Article 7.—Publications

The Society shall publish a quarterly Journal, each issue of which shall contain at least one technical article on American archaeology. The Journal shall be supplied without cost to all Affiliates and Fellows. Other publications may be issued and distributed in such manner as the Council may direct.

Article 8.—Funds

The Secretary-Treasurer shall collect the annual dues and make expenditures in accordance with a budget drafted by the Council and approved at the annual meeting. The payments from Life Members shall be invested in a Permanent Fund, the interest upon which may be used in such manner as the Council may direct. Bequests and gifts will be administered in accordance with the provisions of the donors.

Article 9.—Alteration of the Constitution

This constitution may be amended at an annual meeting of the Society by a two-thirds vote of the Affiliates and Fellows present, provided a written notice of intention to amend has been sent to the membership at least sixty days before the annual meeting at which such action is contemplated.

BY-LAWS AND RULES OF PROCEDURE OF THE SOCIETY FOR AMERICAN ARCHAEOLOGY

Article I

Section 1. The Society is American, its field covering North, Middle, and South America. Inhabitants of any country are eligible to be elected Affiliates, or Honorary Fellows.

Section 2. Scientific research in the archaeology of the New World is interpreted to mean the accumulation, preservation and interpretation by recognized archaeological methods, of all pertinent information for the sole purpose of revealing, in so far as the information permits, the history and manner of living of the aboriginal inhabitants of the New World.

Section 3. The practice of securing, hoarding, exchanging, buying, or selling of archaeological objects for the sole purpose of individual satisfaction or of personal financial gain is declared contrary to the objects of the Society, and therefore detrimental to the Society.

Article II

Section 1. Election as Affiliate or Fellow of the Society must be preceded by a properly executed application filed with the Secretary-Treasurer.

Section 2. An application for affiliation must state the business or professional connections of the applicant, and the nature of his interest

in American archaeology. It must be endorsed by at least one Fellow and one Affiliate in good standing, one of whom must know the applicant personally.

Section 3. An application for election as a Fellow must include a brief biography of the applicant; the nature of his interest or training in American archaeology; the extent of his experience in field and laboratory research; and a list of his publications. It must be endorsed by at least two Fellows in good standing, one of whom must know the applicant personally.

Section 4. When an application for affiliation has been examined and approved by the Council, or upon delegation of its authority to the Executive Committee or Secretary-Treasurer, by said Executive Committee or Secretary-Treasurer, and the annual dues for the current year have been received, the President shall declare the applicant elected to be an Affiliate. The publications issued by the Society during the current fiscal year shall be sent to the newly-elected Affiliate.

Section 5. When an application for a fellowship has been received by the Secretary-Treasurer, he shall submit the name and all pertinent information to the Council, the members of which will proceed to vote upon the application. If two votes against approval are cast, the application shall be laid on the table without prejudice toward the applicant, and his endorsers shall be notified of the action taken. If the application is approved by the Council, the applicant's name shall be placed before the next annual meeting for election.

Section 6. A scientific or historical society or institution, or a public or educational library may, upon payment of annual dues, become an Institutional Member by vote of the Council.

Section 7. The Council may drop from the roll of Affiliates and Fellows of the Society any one who habitually commercializes archaeological objects or sites, or who otherwise has made improper use of his membership, or whose membership is regarded as detrimental to the Society.

Article III

Section 1. The Secretary-Treasurer shall maintain the central office of the Society, which shall serve as a clearing house and advisory center on archaeological matters. He may employ, upon authorization and budgetary provision by the Council, clerical assistance.

Section 2. The Secretary-Treasurer shall act as agent for the Society in correspondence dealing with archaeological matters. He shall transmit to the Editor such information of general interest as warrants

publication. He shall gather and study data needed for reviews and annual summaries of archaeological progress, and for such other purposes as the Council may direct.

Section 3. The Editor shall have complete charge of the publications of the Society. He may, with the consent of the Council, appoint an Editorial Board to assist him. This Board shall represent, as far as practicable, the several fields of interest and the various special areas in American archaeology. The Editor may employ, upon authorization and budgetary provision by the Council, clerical assistance.

ARTICLE IV

Section 1. The Council shall be the responsible governing body of the Society. Seven members of the Council shall constitute a quorum.

Section 2. The Executive Committee of the Council may act for the Council, as a provisional interim committee. A report of the actions of the Executive Committee shall be submitted to and approved by the Council at its next regular meeting.

Section 3. The President, with the advice of the Council, shall appoint a Nominating Committee from among the Fellows at least three months before the date of the next annual meeting. The Nominating Committee shall prepare and submit to that meeting nominations for the offices which are to be filled at the annual meeting, together with a list of the applicants for fellowship whose applications have been approved by the Council since the last annual meeting.

Section 4. The Council shall hold at least one and, if possible, two meetings a year at times and places to be determined by the Council, but preferably in connection with a meeting of some related organization. The annual meeting of the Council shall immediately precede the annual meeting of the Society.

ARTICLE V

Section 1. Regional Divisions shall have the same objects as the Society. Their organization shall be similar to that of the Society.

Section 2. The governing body of each Regional Division shall have sole authority to determine the time and place of the meetings of the Regional Division.

ARTICLE VI

Section 1. The annual meeting of the Society shall consist of at least two half-day sessions. At least one session shall be devoted to a business meeting, conducted in the usual manner. At least one session shall be

devoted to an archaeological meeting, the program of which may consist of papers by Affiliates and Fellows, symposia, and/or informal discussions.

Section 2. When the annual meeting of the Society is held in connection with meetings of a related organization, the archaeological session may be held jointly with a similar session of the other organization.

Section 3. Regional meetings of the Society may, by vote of the Council, omit the business session. The Council may authorize a regional meeting to be held jointly with a local organization whose objects are similar to those of the Society.

ARTICLE VII

Section 1. The quarterly JOURNAL of the Society shall contain reports of the meetings of the Society and of the Council, and such reviews and summaries as are compiled by the office of the Secretary-Treasurer.

Section 2. Each issue of the JOURNAL should contain material of interest to both Affiliates and Fellows, and shall consist, so far as possible or advisable, of at least four sections; a technical report, an editorial section, brief statements, and a bibliographic section.

Section 3. The Society shall plan to issue a NOTEBOOK mimeographed or planographed on $8\frac{1}{2}\times11$ punched paper for looseleaf filing, at irregular intervals as opportunities and circumstances permit, and containing bulletins of current interest and articles on the ways and means of archaeological research, and field, museum, and laboratory methods and equipment.

ARTICLE VIII

Section 1. The official year of the Society shall begin on January 1, and the dues shall be payable on that date. Only Affiliates and Fellows who have paid their dues shall enjoy the privileges of the meetings and receive the publications of the Society, but those not longer than two years in arrears for dues are retained on the rolls. Affiliates and Fellows dropped from the rolls for non-payment of dues may have their names reinstated by payment of arrearages or may be reëlected. Back issues of the publications of the Society shall be supplied only for those years for which dues have been paid.

ARTICLE IX

These By-Laws and Rules of Procedure may be amended by a majority vote of Affiliates and Fellows present at any annual meeting.

CORRESPONDENCE

A Plains Conference

The advance in North American archaeology finds the Great Plains area somewhat near the rear of the procession. Not that there has been a lack of work in the Plains, but, rather, the work has remained unorganized. Reports on research in this field show as interesting materials and other data as are to be encountered in any field, but some of these reports exhibit a lack of information regarding the activities of neighboring investigators that is anything but advantageous to the author. Also, older reports are at times so full of meaningless terms that they are hardly worth reading.

Strong's *An Introduction to Nebraska Archaeology* serves to emphasize the need for better coöperation and organization among Great Plains students. We need a standardized system of culture nomenclature and classification. This will not be realized through writing alone; what the Great Plains needs is a conference.

Conferences have clearly demonstrated their value in organizing the efforts of workers in the northern Plains, Southwest and Woodland areas, and, by way of contrast, the organization in the northern Plains has accentuated the lack of system in the southern Plains. There can be no question of related cultural problems for both the northern and southern Plains. This letter has as its purpose the suggestion that some Plains archaeologist assume the initiative in organizing in the near future a round-table conference for all the Plains, preferably to be held at some centrally located university or other institution.

Fred Carder
Norman, Oklahoma

Cell-Tempered Pottery

Early this spring, characteristic Wisconsin sherds of "cell-tempered" Upper Mississippi pottery, with no shell apparent, were sent for analytic study to J. O. Everhart, Research Engineer, Engineering Experiment Station, Ohio State University. The following is Mr. Everhart's report on his investigations.

"I have received and examined with much pleasure the potsherds sent to me. . . . I am submitting my observations to you for what they are worth.

"Obviously only a very small percentage of the flat cells owe their origin to a substance of vegetable nature. There are some evidences of vegetable fiber imprints in some of the more elongated cells and others have blackened sides which is evidence of the burning out of vegetable matter.

"I am of the opinion that your suspicion as to the shell origin is correct. Some of the fragments when broken open show a decidedly laminated structure composed of clay mass and flake-like grains of white material. This white material is crystalline and has indices of refraction of 1.48 + and 1.66 + which indi-

cates that it is calcite. The flakes as a whole are aggregates of these small crystals which are not much larger than two or three microns in size. There is no question however as to their identity.

"Most marine shells are composed largely of aragonite ($CaCO_3$), which is the same chemically as calcite but different mineralogically. Aragonite alters slowly to calcite on heating to above 100° C. The alteration is quite fast at temperatures approximating those to which the ware has been fired. This alteration is accompanied by a volume increase of 10 to 15 per cent which would have a tendency to spall some of the flakes from the surface. The remainder has probably been dissolved and leached out during the years by the acidulated ground waters. Those flakes still remaining within the interior of the sherds were readily attacked by very dilute acid solutions in the laboratory.

"I do not know how much work of this type has been done on these bodies. Perhaps someone has already advanced the same line of reasoning. I do not consider it conclusive but believe it at least confirmatory to the shell hypothesis. The flat, flake-like structure in my opinion precludes any other origin of the calcite.

"There is evidence that the clay constituents were exceedingly fine grained and undoubtedly very sticky. Without the pulverized shells it would have been nearly impossible to have formed and dried the ware without cracking."

And someone not very long ago asked me if archaeology really needed a laboratory.

W. C. McKern
Milwaukee, Wisconsin

NOTES AND NEWS

Southwestern Area

The Museum of Northern Arizona has placed in the field this summer a small archaeological party under John C. McGregor. This project was divided into two parts. For the first month the party studied pit-houses buried under the volcanic ash from Sunset Crater, with a base camp near Bonito Park sixteen miles northeast of Flagstaff. Later the party moved to the Grand Falls of the Little Colorado River forty miles east of Flagstaff and studied a series of Basketmaker III, Pueblo I, and Pueblo II pit-houses.

The personnel of the expedition included Milton Snow, photographer; George Dickey, clerk; a cook; three Hopi laborers; and the following students of Archaeology: Richard Page Wheeler of Harvard University, J. L. Angel of Harvard University, Walter P. Taylor, Jr. of Yale University, and Marshall T. Newman of the University of Chicago.

For the fourth consecutive summer Dr. Byron Cummings of the University of Arizona worked at Kinishba, a large Pueblo IV ruin near Fort Apache, Arizona. Investigations here have been carried on along the lines of a field training school with about 25 students in attendance this year. During the current season, aided by Apache laborers, a part of the pueblo has been restored.

An expansion program at the University of Arizona includes a new State Museum building, now under construction, of which Dr. Byron Cummings is the Director. This building will provide for the first time adequate housing facilities for the superb collections of southwestern materials to be found in this institution.

That new and startling facts are still to be found in areas which have been studied for many years was demonstrated by some recent work carried on by Gila Pueblo at Snaketown, an ancient Hohokam village located on the Gila River about 25 miles southeast of Phoenix, Arizona. During the course of the excavation of the site, a large oval depression flanked on the long sides by high earth works was partially cleared. Clearing the fill revealed a well-defined floor measuring about 90 by 150 feet, the long axis extending roughly on an east-west line. The high earthen sides proved to be the remnants of walls whose faces sloped outward from the floor. Three stones were found as floor features: a central stone buried somewhat below floor level and one near each end of the structure projecting a few inches above the floor. Semi-circular areas enclosed by low earthen ridges occurred at each end of the structure. The height of the walls bordering the floor is from 8 to 10 feet and it is estimated that originally they rose to at least 15 feet.

The resemblance of this structure to Central American ball-courts became obvious as the respective features were uncovered, but its identification as such did not come until July when Snaketown was visited by Mr. Harold S.

Gladwin, Director of Gila Pueblo, accompanied by Drs. A. V. Kidder, S. G. Morley, Donald Scott, and D. W. Strong. That a relationship exists between this ball-court, and others now known to occur in southern Arizona, and those of Central America seems certain, but the problems raised by this connection open a fresh line of investigation.

In addition to this interesting phase of the work at Snaketown, several new stages in the development of the Hohokam were defined which will ultimately bring about a re-orientation of certain ideas in connection with southwestern culture growth.

Plains Area

Digging has been carried on for the fourth field season in Montana, by Melville Sayre of Montana School of Mines, archeologist to the State Bureau of Mines and Geology. A survey of Yellowstone River valley from Miles City to Glendive, in eastern Montana, has revealed numerous camp sites, but has shown this region to be notably lacking in the buffalo cliffs which are common in central and northern Montana. Rare also are the groups of tipi circles and the rock alignments found in other parts of the state. The most important site discovered is a ten-acre camp in Ash Coulee, a spring-fed valley in Sec. 36, T. 12 N., R. 51 E., Prairie County, four miles south of Yellowstone River. Here firepots, stone and bone artifacts, and pottery, the first reported from Montana, abound. The soil layer is thin, six inches to three feet, overlying clays and coal beds. Several tributary coulees have exposed cutbanks of fair fire clay above and below Fort Union coal beds. Although the pottery apparently was fired on this site, ceramic tests of the clay and of the pottery sherds will be made to verify this conclusion.

Stone artifacts include scrapers, knives, and other skinning and fleshing tools; spearpoints and arrow points; and stone mauls. These are fashioned from chert, flint, quartzite, obsidian, petrified wood, and agate.

The pottery is light to dark gray, grayish black, or rarely brownish gray. Undecorated sherds are as thin as $\frac{1}{8}$ inch. Decorated and undecorated sherds up to $\frac{3}{8}$ inch in thickness are numerous. Decoration is limited to crudely incised, roughly parallel straight lines in light to heavy grooves. Rims have several incised patterns, but some are plain. The texture is coarse and often sandy. Although several boxes of sherds have been unearthed, no complete pots have been found. Enough fragments have been collected, however, that laboratory reconstruction of several complete pieces should be possible.

The Archaeological Survey of the Nebraska State Historical Society, under the supervision of Director A. T. Hill, reports a very successful field season. Of particular interest was the discovery that ceramics practically identical with those of the prehistoric Oneota culture of Iowa occur in several large sites in southeastern Nebraska and northeastern Kansas. Despite much searching, only one square earth lodge was uncovered, but storage pits were extremely numerous at these sites.

Other prehistoric earth lodges were excavated on Salt Creek, and near Fremont. The former appeared to be very old and possessed pottery of what appeared to be a mixed Upper Republican and Nebraska aspect type. The latter site was definitely of the Nebraska aspect pattern, and one of the rectangular earth lodges appeared to have served as a charnel house.

In addition, work was prosecuted in two protohistoric and one prehistoric Pawnee villages, and in a late historic Oto site. The results of the season's activities will be published in the near future.

George F. Will and Russell Reid of the North Dakota Historical Society report extensive excavations and restorations at the Fort Lincoln Mandan site, North Dakota. This site, owned by the Society, has been excavated by the men of a nearby C.C.C. camp under the general supervision of the North Dakota Historical Society officials. Several complete earth lodges have been excavated and restored, and a very large and important collection of Mandan archaeological material recovered.

Northern Mississippi Area

The University of Chicago Field Party (1935), under the personal direction of Thorne Deuel, continued work for the second season at the Kincaid site. This is primarily a village site consisting of low domed elevations and ridges used for house sites. Rubbish accumulations and sometimes earth carried in, have increased the height of these natural elevations to a greater or lesser degree. On the northern periphery of the site a low ridge with eleven low and almost equally spaced eminences, may have served some purpose other than housing. In addition to the domed mounds mentioned above, there are three pyramidal and two other large tumuli.

The largest mound (Mx°8), the base of which covers more than 1.8 acres, was examined and was determined to be of artificial construction.

Rather extensive excavations were carried on in four portions of the site. The chief result of this season was the determination of the characteristic house structures. Several house levels occur at the different locations examined. Thatch and roof beams, wall posts and trenches in which the walls were set, layers of split and whole cane, and cane matting occur in large sections. In one case the plaited cord or rope was found still securing one end of a beam to another. Casts of wall posts with impressions of cane cross pieces were found in fragments of burned clay with grass for binding material. Clay walls appear to have been smooth on both sides, or quartered cane was impressed into one or both surfaces. Floors and hearths were made of puddled clay and smoothed carefully. It is hoped that the complete aboriginal structure can be determined from the evidence secured.

The artifacts, with a single exception, added little to last year's record. The exception is the pipes, only one identifiable fragment having been found last year. Most of those found this season are "equal-armed" Mississippi (though

relatively small) as to general type, and for more specialized features have the flat rest beneath the bowl and the projecting stem, commonly found in eastern Arkansas. Also a stemless ovoid-shaped pipe was recovered.

Camping conditions were excellent this year, chiefly due to Jennings' excellent preparations prior to the arrival of the main group. On the other hand, rains and high water proved troublesome, making roads and "bridges" impassable and frequent repairs necessary.

Survey was next to impossible on account of high weeds, high corn, or foliage on trees and brush. The Department hopes to make a complete survey and contour map of the Kincaid site and aboriginal remains on adjoining farms this fall. Among interesting sites located was a Woodland site, about two hundred feet wide and a quarter of a mile in length, literally strewn with potsherds and projectile points. This material seems to be of the same focus as that underlying the Mississippi material in a mound on the Kincaid site.

A new aspect of Woodland culture for Wisconsin was encountered during the past summer as the result of mound excavations conducted jointly by the University of Wisconsin and the Milwaukee Public Museum, under the supervision of Dr. Ralph Linton, and the field direction of W. C. McKern. One large and three small mounds in Burnett County, northwestern Wisconsin, were excavated. In addition, work was conducted at an adjacent camp site, and one small mound in Barron County was examined.

The small mounds in Burnett County provided a very limited quantity of data, all indicating a Woodland manifestation of previously known pattern. The large mound, however, a semi-spheroidal tumulus fourteen feet in height and ninety feet in diameter, exhibited a striking variety of structural and burial features not previously reported for this state.

In constructing this mound, the floor area had been carefully cleared of humus to expose a surface of clean yellow sand. Upon this was laid down a polychrome floor made up of separate loads of materials richly variant in color, some apparently from rather remote sources. These materials included heavy black peat, yellow sand, orange sand, gray marsh sand, light brown clay, red ocher and yellow ocher. In the center of this floor a primary mound about three feet in height was built of dark, sandy humus soil. This was covered with a somewhat less colorful layer of the materials employed in the mound floor. Several secondary burials were then deposited on this prepared surface and covered with a secondary mound of humus which raised the total height to from six to seven feet. The top of this secondary mound was similarly surfaced, covered with secondary burials and surmounted by a tertiary mound ten to eleven feet in height. There was abundant evidence that a considerable interval elapsed, sufficient to permit the growth of good-sized trees on the surface, before the deposit of a third statum, in this instance of yellow sand and secondary burials, and the erection of the quaternary and final mound. Forty-eight burials, containing the partial skeletal parts of a minimum of two hundred individuals, were found.

In many instances the burials were floored, covered or wrapped with bark, most commonly birch bark. Several large, bowl-shaped containers, fashioned of several pieces of bark sewed together, were found associated with burials. One of these was sufficiently well preserved to be taken out intact in a plaster-of-paris shell. The oil of birch, tannin and other elements in the bark had served to preserve contacting fragments of cloth and the fur and claws of a beaver skin.

Some of the bones were discolored with red ocher, and many of the humeri, femora and tibiae had artificial openings near one end, broken through into the medullary cavity.

A quantity of pottery was associated with the burials, including sufficient parts to permit the complete restoration of one small and four large vessels. The pottery is characteristically Woodland, but shows peculiarities in the corded, cord-imitation stamp and carved-paddle decorations which readily permit differentiation from other known Woodland wares of this district. Triangular arrow points (the only Mississippian trait present in the complex), a variety of pointed scrapers new to local experience, and two pottery pipes were also found with the burials.

The small semi-spheroidal mound in Barron County produced a compound cremation of disarticulated bones, contained in a rectangular area inclosed by four substantial logs, of which charred portions remained. This was one of the Cyrus Thomas group of mounds, some of which were previously excavated by L. R. Cooper, as reported by him in *The Red Cedar River Variant of the Wisconsin Hopewell Culture*, Milwaukee Public Museum Bulletin, Vol. 16, No. 2, 1933. Cooper's work was noteworthy for the discovery of clay masks, realistic representations of the human face built upon skulls and accidentally converted into soft pottery in the source of cremation. As a result of the work with which this report is directly concerned, parts of seven of these masks were found, several sufficiently well represented to promise satisfactory restorations, including a good portion of one mask intact and actually covering parts of a burnt skull.

Work on the Otter Creek mounds of Jersey County, Illinois, was continued by Dr. P. F. Titterington during August. Four mounds of the Isringhausen group and two in the Saeger group were excavated. Mound 10 of the Isringhausen group produced an interesting series of features. The first of these was a definitely rectangular plat of thin limestone slabs compactly laid edge to edge, eight feet long and five feet nine inches wide. At the center of the south end were two slabs in a semi-upright position, apparently intended as foot rests for an extended burial of which only the bones of the arms and chest region remained.

The second feature was a mass cremation of twelve fully flexed individuals placed in a rectangular area six and one-half feet long and four feet wide. Part of a shell spoon and a marine shell bead were encountered with the bones.

A third feature was a stone cist, twenty-two inches high and fourteen inches wide, composed of sixteen small limestone slabs.

The fourth and fifth features were compound primary burials, one of sixteen individuals and the other of an indeterminate number, due to previous disturbance. Both flexed and extended positions were encountered in these burials. Worked antler tips, a perforated split canine tooth of some animal, chipped-stone implements, Anculosa beads and flint chips associated with antler flakers were found with the bones of the undisturbed burial.

Another mound produced the first secondary burial encountered in these mounds.

Northeastern Area

Arrowmaking Revived. An Associated Press dispatch stating that the Indians of New York had lost the art of chipping arrow points and that Arthur C. Parker, Director of the Rochester Museum, believed that the art might be recovered slowly, was given wide publicity. Needless to say, no such statement was given out but the damage had been done. Seventy letters came to the museum offering information about the art of flint "knapping" and several offered to sell the secret. Mr. Parker, to offset the error, took a dozen local Indians from the Tonawanda reservation to a nearby chert ledge and had these Indians chip arrow points in the presence of several newspaper reporters. This, too, was given wide press publicity and was broadcast over the radio.

It was noticed that the new arrow points had a fresher surface and this set them apart from more ancient specimens.

Phillips Academy, Andover, Massachusetts, is engaging this summer in the excavation of what appears to be a very early site in Rhode Island. Mr. Douglas S. Byers, Assistant Director, is in the field, but Doctor Moorehead, whose health, however, is improving, will be unable actively to participate. Doctor Moorehead's studies of "The Axe and its Variants" are still being continued by Mr. Fred Johnson.

The third season of exploration of an Algonkin site on the Vermont shore of Lake Champlain, opposite Fort Ticonderoga, will begin soon for the Museum of the American Indian, Heye Foundation, according to Mr. Heye. Mr. Olsen will again be in charge of the operations. In the previous digging several burials were opened which contained the following types of artifacts: large native copper bead, birdstone, bar amulet, boatstone, polished chalcedony adze, grooved axe, notched arrow-point, spoon-shaped scraper, peculiar Iroquoian looking pottery with flat bottom, and clay tube with partly closed end. Several of the latter were of unfired clay and were removed and restored with difficulty. Their most unusual feature was a small elongated plug which fitted the small aperture in the partially closed end.

On Long Island several Algonkin village sites are reported in course of examination by the members of the Long Island Chapter, New York State Archeological Association. Messrs. Charles F. Goddard, Roy Latham, and Nat E. Booth, in particular, are continuing their labors of several years in the vicinity of Orient at the eastern end of the island. Already several hundred pits

containing a large quantity of punctate-decorated, pointed-bottom pottery, grooved axes, celts, roller pestles, notched, barbed and triangular projectile points, bone awls, harpoons, fishhooks, flat needles, conical antler arrow points, and many other artifact types have been opened.

The Rochester Museum of Arts and Sciences, under the direction of Arthur C. Parker, is now in the field. William A. Ritchie is in active charge of the expedition which is working on a singular Algonkin workshop site near Bainbridge. Sites in the lower Susquehanna valley, New York; along the Mohawk River; and in the vicinity of Seneca Lake will be investigated during the course of the summer.

Southeastern Area

The Department of Archaeology of the University of Tennessee, with T. M. N. Lewis in charge, has completed the excavation of a large mound in Roane County. The mound was found to contain the remains of semi-subterranean lodges involving twelve structure levels, each of which produced evidence of the former presence of several buildings. Both of the types previously encountered in the Norris Basin were present, one type in the upper quarter of the mound and the other in the lower three-quarters. This chronological sequence presents the first data on the relative ages of these types that have been obtained. No burials were encountered.

Preparations are under way for starting operations at the Link site on the Duck River.

Middle American Area

The Carnegie Institution of Washington in 1934 was granted a contract with the Mexican Government permitting that institution five more years of research, not only at Chichén Itzá but also in certain other parts of the Republic. However, during the winter of 1934–1935 excavations were discontinued at Chichén Itzá, and the staff there devoted their time to preparing for publication some of the results of the work of former years. Dr. Sylvanus G. Morley has at last completed his second monumental work on Maya inscriptions, and *The Inscriptions of Peten* is now ready for press. Karl Ruppert's large report on *The Caracol*, with 294 pages and 350 figures, was published in April.

At Copán, Honduras, Gustav Stromsvik and Deric Nusbaum of the Carnegie Institution assembled and re-erected the fallen and broken stelae, and excavated some cruciform cists under stelae and altars. It was in one of these that the gold objects were found which attracted much newspaper publicity. They seem to be two very small legs broken from a golden figurine; the technique suggests that they were imported from the Isthmian region. While this find does not alter the uniform belief that the Early Maya did not work gold, it indicates that gold was known in not far distant regions in Early Maya times. The Government of Honduras is contributing labor and funds to the work. The recent earthquake which received so much publicity did not greatly damage the ruins.

Dr. A. V. Kidder during the winter visited Chichén Itzá, Kabah, Quirigua, Guatemala City, San Agustin Acasaguastlán, Copán and Uaxactun and observed the work of the Carnegie Institution in progress at these sites. He and Dr. and Mrs. Oliver Ricketson dug for ten days at the well-known "archaic" site of Finca Miraflores just outside of Guatemala City, and later at San Agustin Acasaguastlán near El Rancho in the Motagua Valley. At the latter site are some peculiar vaulted burial chambers. Dr. Ricketson also dug in some mounds at Salama. These excavations were primarily to ascertain pottery types and to establish ceramic sequences. Great quantities of sherds were gathered, but the scientific results of the study have not yet been announced.

Henry Roberts and Harry Pollock of the Carnegie Institution made some researches at the Maya city of Kabah in Yucatan, paying especial attention to a study of the ceramics and architecture. The Institution has continued its work at the Early Maya city of Uaxactun where Ledyard Smith has been making a very complex and important excavation on the Palace. Both very important data and beautiful objects have resulted from his work.

Dr. George C. Vaillant of the American Museum of Natural History of New York spent the winter as usual excavating in the Valley of Mexico. He spent the months of October and November, 1934 in surveying the region in search of suitable sites for excavation and collecting superficial pottery types. His most important find was a large Mazapan dump at the city of Tula. In December he and Mrs. Vaillant dug for three weeks at Santiago Ahuitzotla near Atzcapotzalco to check up on the peculiarities of the Teotihuacán culture there. They distinguished two periods, one which corresponds with and overlaps Teotihuacán II and III, and another more developed as regards pottery figurines than anything heretofore found in the Teotihuacán archaeological zone. He is inclined to term this period Teotihuacán V, since at Calpulalpan in Tlaxcala they found a figurine transition between the archaeological zone of Teotihuacán types and the very developed Atzcapotzalco styles. They did not find any trace of Tozzer's Coyotlatelco pottery, which may belong to a phase different from Teotihuacán. After having gathered a fair sample of three thousand catalog entries, they ceased work here.

The next excavation undertaken was at Chiconauhtla, on the road to Teotihuacán. This site is mentioned in early accounts as a frontier town, tributary to Texcoco; consequently they hoped to establish a correlation between pottery types and dated historical events, but it is yet too soon to say whether this can be done.

Three months were spent in excavating a dwelling or palace of the Aztec period and a large rubbish dump of the Mazapan period. In the latter some important finds were made which will serve as links in dating ceramics; such as plumbate ware and some sherds of carved pottery, the latter of which occurs as a trade ware during the period of Mexican occupation at Chichén Itzá. The Aztec house was not very prolific so far as objects were concerned. Two certain occupation periods were distinguished and the later of these may be subdivided; there was considerable local peculiarity of design, as expected.

At last reports Dr. Vaillant was studying his potsherds to see how the sequence at Chiconauhtla will check up with those at Tenayuca, Culhuacan and Tenochtitlan; it may throw some light on the problem of the degree of development of Aztec culture in the Valley of Mexico before the advent of the Tenochca, the founders of Mexico City. In the fall, at the close of the rainy season, Dr. Vaillant intends to sink some test-pits at Nonoalco in the City of Mexico, and various other pits in other places in order to check up further the stratigraphical sequences of the Aztec and Chichimec periods.

We understand that Miss Isabel Kelly of the University of California also pursued stratigraphical archaeological investigations during the winter in the State of Sinaloa, and later in the Valley of Mexico, but have received no details as to results.

One of the most interesting and puzzling archaeological discoveries of recent years was made in Puerto Rico by Froelich G. Rainey of the Peabody Museum of Yale University. Working on a shell-heap near Ponce, he and other native archaeologists found on the surface the usual accumulation of mollusc shells and pottery of the typical unpainted Arawak type. Beneath this, at a depth of several feet, a very different culture came to light. Remains of crabs replaced those of molluscs, indicating that this was the staple diet of the earlier people. The ceramics were of a higher grade and decorated with prominent designs in contrasting red and white colors. Who these "crab-eaters" were has not even been suggested yet. Until Harrington found remains of the rude Ciboney culture, it was presumed that the Arawaks were the first inhabitants of the islands, and any painted pottery heretofore found was ascribed to the later Caribs of shortly before the Spanish Conquest. It is doubtful if this fine pottery can be connected with the Ciboney.

Neil M. Judd, Curator of Archeology at the U. S. National Museum, Washington, spent three weeks during September examining various archaeological sites in the Valley of Mexico. As representative of the Smithsonian Institution and a member of the official U. S. delegation to the Seventh American Scientific Congress, Mr. Judd's time was partly occupied with scientific meetings but he found ample opportunity to become acquainted with the numerous investigations of Mexican archaeologists.

The Maya Society of Johns Hopkins University continues publishing items from its unexcelled collection of old Maya sources. The most interesting publication recently has been that of the Gomesta Manuscript which Mr. Gates believes will be a Mayan "Rosetta-stone" for the decipherment of the glyphs. Frans Blom, however, has gone on record as considering it a rather modern fraud; further researches will probably be necessary to evaluate its true importance.

In 1934 José García Payón of the museum at Toluca, State of Mexico, pursued archaeological excavations at Calixtlahuaca near Toluca. Three edifices were found, two of them supposed to be temples of Quetzalcoatl and of Tlaloc. In each, as is usual in Mexico, several superposed structures were found. The temple of Quetzalcoatl was of a cylindrical form. Large sculptured stones, some of them representing serpents, were found. Judging from the ceramics, the structures are presumed to belong to the Matlaltzinca culture.

Work of the Dirección de Monumentos Prehispánicos of the Secretaría de Educación Pública, Mexican Government, since January, 1935: (Data from Eduardo Noguera, of the above Dirección).

Cholula, Puebla: Tunneling was continued in the interior of this great pyramid for the purpose of ascertaining the internal structures. Up to the present, more than a kilometer of tunnels have been made which have revealed a series of buried edifices with staircases and sloping (battered) walls some of which were painted with frescoes. These belong in general to the Toltec or Teotihuacán culture and are naturally older than the structures found on the surface of the pyramid. As in most Mexican and Mayan pyramids, the earlier structures were covered over at a later period in order to enlarge the ensemble.

At the same time, Sr. Eduardo Noguera, of the Dirección de Monumentos Prehispánicos, made stratigraphical excavations in the buried interior structures, and also in the vicinity of the pyramid on ground level, and ascertained the existence of three superposed cultures: Archaic, Toltec or Teotihuacán, and Cholultec. The Archaic was found in the lowest levels around and beneath the pyramid; the Toltec, within the interior structures. The Cholultec is represented by the superficial structures and the surface ceramics, and corresponds to an age more or less contemporary with the Aztec.

Xochicalco, Morelos: The first methodical and precise explorations in this important archaeological zone were begun this year. They centered in the upper court around the monument containing the famous reliefs which were restored by Leopoldo Batres in 1910. Here were discovered groups of chambers in large numbers, which seem to have been dwellings. In addition, a wide trench was made to east and west of the upper court for the purpose of establishing the vertical section of all the constructions on the terraces of different levels which cover the slopes of the hill on which Xochicalco was built.

Here also Sr. Noguera made stratigraphical excavations at many points in the archaeological zone. Although the ceramics resulting from this work have not yet been studied completely, it may be noted that examples of pottery have been found that bear no obvious resemblance to any known ceramic type from central Mexico. It is probable that the relationships are with the more distant Zapotec, or even the Maya. Another type found is apparently more recent and recalls a type frequently found in the Valley of Cuernavaca, and termed Matlaltzinca or Tlahuica.

El Tajin, Vera Cruz: Exploration and restoration have been carried on in

this famous pyramid near Papantla. It is relatively well preserved and characterized by niches in the seven terraces composing its slopes. The thick vegetation was cut down and the fallen stone slabs and blocks replaced under the supervision of Sr. Garcia. Sr. Enrique Juan Palacios carefully surveyed the surroundings and discovered excellent relief carvings of symbolical character which establish the relations between the people who constructed this pyramid and other cultures of ancient Mexico.

Chichén Itzá, Yucatan: Restorations were continued on the "Ball-Court" and the "Castillo," and minor excavations carried out. The excavations in the latter afforded the more important results. A buried interior structure, covered up by the last building phase, was discovered by means of a tunnel driven through one of the external staircases. The interior structure is very similar to that of the last period which crowns the pyramid and is very well preserved. The most spectacular result of this excavation was the discovery of a carved stone figure of the well-known "Chac Mool" type, covered with painting, and with the eyes inlaid with shell.

Palenque, Chiapas: The work at Palenque consisted mainly of the restoration of several of the most ruined structures, such as the "Temple of the Sun," the "Temple of the Cross" and the "Palace," for the purpose of preventing more deterioration. Sr. Miguel Angel Fernández was in charge of this work. He also made minor excavations during which he found important relief carvings with significant chronological glyphs.

No direct word has been received from Sr. Alfonso Caso, Museo Nacional de Arqueología, Mexico City, but it is understood that he is continuing his excavations at Monte Alban in the Zapotec region where he found the spectacular collection of jewelry several years ago. We hope to have a fuller report from Sr. Caso in our next digest of Mexican work. We understand that he has established five ceramic periods at Monte Alban: (1) quasi-archaic, (2) Q-complex forms, (3) pottery closely connected with Yucatan Maya forms, (4) "Classical" Zapotec, (5) Mixtec.

Sigvald Linné and Gösta Montell of Stockholm, Sweden, spent several months working around San Andrés Chalchicomula in the Valley of Mexico, Linné doing archaeological work and Montell ethnological investigations. No data are at hand regarding their results but we hope to have them for our next report.

Mrs. Helga Larsen and her sister excavated at Calpulalpan in Tlaxcala on behalf of the Swedish expedition. A burial was found which, in addition to some pieces of large ordinary pottery, afforded a beautiful perfect pottery bowl with carved or moulded pictorial decoration showing a ceremonial scene in which four priests participate. While of general Toltec or Teotihuacán type, it greatly resembles Maya ceramics and contains glyphs apparently of Zapotecan type. It has been sent to the Mexican National Museum.

A joint expedition of the Danish National Museum and the Department of Middle American Research of Tulane University, New Orleans, represented respectively by Jens Yde and Frans Blom, made archaeological researches in Honduras. On Lake Yojoa they found what are probably the southeasternmost Maya ruins so far recorded, a temple site on Islita Island in the lake, with much Maya pottery on the shores, and seven extensive groups of mounds. The small island was artificially rebuilt into terraces and substructures of the Mayan style. On one mound could still be seen stone columns carved with the heads of serpents. These ruins probably date from the time of the height of the occupation of Copán. Mr. Yde is preparing the report of the expedition.

Excavations were also carried on in 1934 at the archaeological site of Ixtacamastitlan, State of Puebla. Many stone walls were found which contained traces of sculpture and of paint. Many tombs of superposed stones are found in the vicinity, and many small objects of stone and obsidian, and pottery figurines, are picked up on the surface. A large head of a stone serpent, and a stone statue of the god Tetzcatlipoca which held in his hands an obsidian mirror, were among the other discoveries. The region seems to be a very important and fruitful one, probably on the Aztec horizon.

El Mexico Antiguo, the organ of the German Society of Mexicanists in Mexico City, which was founded by Hermann Beyer, has recently been revived under the editorship of Dr. B. P. Reko. Articles on Mexican archaeology are published in Spanish, German, English and French, generally several numbers and papers to each issue. Twelve numbers will compose a volume of not less than 360 pages for which the subscription price is five dollars. Subscriptions and scientific contributions are solicited, fifty reprints being supplied to the author. Subscriptions should be sent to Mr. A. Gibsone, Tiburcio Montiel 37, Tacubaya, D. F.; contributions and requests for exchange, to Dr. B. P. Reko, Gelati 15, Tacubaya, D. F.

Miss Emma Reh has made a number of interesting discoveries in the state of Guerrero. One of these was at the ruin of La Labrada near the Pacific coast. Here she found a number of carved monuments with glyphs, among them one which, in variant form, is found in the Maya region of Yucatan, the Zapotec region of Monte Alban, and the Toltec region of Xochicalco.

Miss Reh also found in Oaxaca an ancient "codex" or pre-Columbian book, written on deerskin and folding into eleven pages. It is of especial value because it dates from about the time of the Spanish Conquest, and the picture writing is accompanied by an explanation written in the Mixtec language in Spanish orthography. It apparently gives family history and genealogy from the year 1300 up to 1684, though the early part is probably traditional and the codex made about the latter date. There are said to be more of these old records preserved in the Indian pueblos of Oaxaca.

Maya Research, a quarterly publication of the Alma Egan Hyatt Foundation, has recently been inaugurated, the first number published July, 1934. Articles, notes upon current work, and notes and reviews of publications, keep the reader informed of current progress in this field. The editor is Frans Blom of the Department of Middle American Research, Tulane University, New Orleans, La. The annual subscription is five dollars.

Early Man

Further investigations were carried on at the Lindenmeier Site north of Ft. Collins in northern Colorado, during the months of June, July and August, by Frank H. H. Roberts, Jr., of the Bureau of American Ethnology, Smithsonian Institution. Preliminary exploration of the site in the autumn of 1934 demonstrated that it contained material attributable to so-called Folsom Man. Not only do typical Folsom points occur in an undisturbed stratum several feet beneath the present surface, but they are accompanied by a series of other implements. This establishes a definite complex for the group. The material is found in association with an extinct species of bison and under conditions which indicate considerable antiquity, although a definite geological horizon has not yet been established for the site.

During the 1935 season a large quantity of material was obtained. In addition to more than 500 stone implements, most of the bones from nine individual bison were secured. The species of the latter has not been identified. The animals were considerably larger than the modern bison, and measurements taken in the field indicate that they closely approximate the *Bison taylori* of the original Folsom pit. As a result of the work at the Lindenmeier Site, it will be possible to draw a more detailed outline of the Folsom implement complex. No human remains have been found at the site.

Dr. Kirk Bryan of the Division of Geology, Harvard University, assisted by Mr. Franklin T. McCann of Yale University, spent the month of July studying the geology of the region. Their report will constitute a part of the general paper on the site.

A large number of people visited the Smithsonian Institution's camp at the diggings during the course of the summer. Among them were Dr. A. V. Kidder and Earl H. Morris, of the Carnegie Institution of Washington; Dr. Donald Scott of the Peabody Museum, Harvard; Willem Van Royen and A. L. Lugn, of the University of Nebraska; C. Bertrand Schultz of the Nebraska State Museum; and Dr. Paul MacClintock of the Department of Geology, Princeton University.

The Colorado Museum of Natural History, Denver, also had a party at the Lindenmeier Site. Mr. Jack Cotter and Mr. Harley Goettsche conducted excavations for that institution under the general supervision of Director J. D. Figgins, who was a frequent visitor at both camps. The material which they obtained supplements and amplifies that secured by the Smithsonian group.

The Lindenmeier Site was originally found by Judge C. C. Coffin and his son, A. L. Coffin, of Ft. Collins. It was prospected by them and Major Roy G. Coffin and was called to the attention of the Smithsonian Institution by Major Coffin.

A human skeleton was uncovered in June, 1935, in a gravel pit near Lake Guerney, West Union Township, Todd County, Minnesota, by a group of F.E.R.A. laborers who were digging material to spread on a nearby road. Conservation of the bones and an adequate record of the observations of the workmen were made possible by the prompt action of the Rev. Henry Retzek within whose parish the find was made. A brief geological investigation of the location was made by Professor Kirk Bryan, Harvard University, the Rev. Henry Retzek, and Mr. Franklin T. McCann. Their report, including a map of the site, is already in manuscript form. Professor A. E. Jenks of the University of Minnesota plans to study and report on the physical characteristics of the skeleton.

The presence of certain features not consistent with those of the modern Indian, and the occurrence of the bones in relatively old gravel, possibly a glacial deposit, call for more than cursory examination of both the skeleton itself and the deposit in which it was found. The bones lay in apparently undisturbed gravel, from 16 inches to 4 feet below the surface of the ground. They were not accompanied by artifacts.

The Andersen collection of Yuma chipped stone artifacts has been deposited in the Indian Gallery of the Denver Art Museum as an exhibit of prehistoric stone art. The owners felt that the collection was of too great importance to be kept in a somewhat out of the way place and requested that the museum take over its care until a final disposition is made.

The collection contains several hundred Yuma artifacts, such as projectile points, knives, gravers, and scrapers. A large number of these are unbroken and of the finest workmanship. Included are the type specimens on which Dr. E. B. Renaud based his classification of Yuma points. The collection also includes a number of Folsom and transitional types. Besides the points there are four specimens *in situ* in blocks cut from the beds in which the points were embedded.

The Andersens have gathered this collection in the neighborhood of Yuma, Colorado, during the past twenty years. Following the recognition of Yuma and Folsom points as ancient types, care was taken by the Andersens to record the locations and depths of all finds. A book of notes and maps accompanies the collection.

BOOK REVIEWS

An Algonkin-Iroquois Site on Castle Creek, Broome County, N. Y. WILLIAM A. RITCHIE. (Research Records of the Rochester Municipal Museum, No. 2., 58 pp., Rochester, New York, 1934.)

The excavation of this prehistoric village site, on a gravel knoll at the conjunction of Castle Creek and Chenango River, was begun in June, 1931, and completed in 1933. Ninety per cent of the site was explored, revealing 116 pits and 11 burials.

The pits were used mainly for the storage of food which was consumed during the winter, in the author's interpretation, and in the spring, after they had been emptied of most of the stored food, some were used as refuse pits, since deposits of ashes and charcoal containing refuse material were found immediately above the bark or grass which lined the bottoms. The author believes that the occasional presence of burned soil, ashes and charcoal in the bottoms of pits indicates that they were dried out by fire before deposition of the caches of food. A few of the pits had floors of sandstone slabs or burnt and unburnt cobblestones. Locations of artifacts in the pits were recorded by vertical levels but while in many instances "Typically Algonkin sherds repeatedly overlay fragments bearing Iroquois traits," the presence of essential elements of both ceramic groups on the same vessel, and the occurrence of sherds of either one or the other at upper and lower levels of the same pit discount any suggestion of a progressive change in ceramic types.

The author devotes several pages in the forepart of the paper to an interpretation of his data. This is followed by a description of representative pits, artifacts classed according to the materials of which they were made, and burials.

In discussing the pottery of the Castle Creek Site, Ritchie first devotes three pages to pottery of the Middle and North Atlantic ceramic group, ending this discussion with the statement that the pottery constituting a regional variant in this group, found as far north as Nova Scotia and being at an archaic horizon over the entire area in which it is found, is identical in all essential features to the pottery of the Third Algonkin Period in New York, and "consequently to the ware from Castle Creek." One page follows in which the pottery actually from the site under discussion is described, in rather general terms. No entire vessels were found, but a number of illustrated sherds bearing a close similarity to two entire pots of the Third or Late Algonkin Period, from an unnamed site, suggests that the vessels of the Castle Creek site had broadly conical bases and moderately constricted necks. The rims of sherds from Castle Creek are everted or collared, the latter feature, in combination with bosses and incised parallel lines, providing the chief Iroquois element.

Stone artifacts were represented by notched and triangular projectile points, hammerstones, anvil stones, "sinew" stones, celts and adzes, two cylindrical

pestles and a mortar, and notched net sinkers, pick and hoe-like forms and chipped stone discs of unknown use. Chief in interest among the artifacts of bone and antler are several rejects of fish-hook manufacture indicating the practice, not before encountered in New York, of cutting the hook out of a piece of bone by incision and drilling, rather than producing two hooks from a hollow oval of bone.

Elbow clay pipes were abundant, and bear punctate marks in linear arrangement or over solid areas. One has a mask-like face in intaglio, which the author believes to have been originally filled with a colored paste. Nearly every pipe bowl contained charred tobacco.

The pits found were distributed fairly evenly throughout the entire site, but were in several instances in groups of five or six corresponding possibly to individual house sites. No evidence of a palisade is described, but four post molds in a straight line, about seven feet apart, indicate the possibility of a rectangular house of poles and bark similar to that used by the Iroquois.

Eleven burials were found, five on the site itself and six on a sandy knoll between it and Chenango River. Some of the graves contained refuse material. The author mentions burial when the ground was frozen as a possible explanation. The skeletal material obtained, in an advanced stage of disintegration for the most part, is the only skeletal material from a site attributed to the Third Period Algonkin.

E. F. GREENMAN

Types of East Texas Pottery. A. T. JACKSON. (Texas Archaeological and Paleontological Society, Volume 6: 38–57, September, 1934.)

The pottery reported upon consists of 2,000 vessels from sixteen counties and four river valleys in northeastern Texas. The report, aided by the photographs, shows clearly the extension into this area of a culture having pottery which is similar to that obtained by Harrington in southwest Arkansas. The author's discussion of his material centers around its mode of occurrence with the burials, the number of different shapes found in each county, a comparison of Texas and Arkansas forms, the size of different shapes, and descriptions of the various wares, temper, surface finish and decoration.

While the writer has evidently devoted considerable time and effort to this presentation of east Texas pottery types, I do not feel that an outsider can obtain from this report a very clear idea of those types in their entirety. While the occurrence by shape in the various counties is given, and other features of the vessels are briefly described, there is little or no attempt to correlate these features save in the last section of the paper where the probable cultures are discussed. In this latter section the pottery is described with reference to the river drainage basins.

I personally feel that pottery measurements should be given in the metric system, easily accomplished with calipers such as are used in taking cephalic measurements. The classification of the pottery into wares on the basis of

thickness and weight is a questionable procedure. In the more exhaustive study which Mr. Jackson proposes, one can hope that the analysis of the various features of the ceramic complex will be correlated in a clearer manner so as to give the reader a better conception of the various types, and that the accompanying archaeological traits will be mentioned.

JAMES B. GRIFFIN

A Folsom Complex. FRANK H. H. ROBERTS, JR. (Smithsonian Miscellaneous Collections, Vol. 94, No. 4, 35 pp., Washington, 1935.)

This preliminary report on investigations at the Lindenmeier site in northern Colorado is of outstanding interest and importance to all who may be concerned, from whatever angle, in the subject of early man in America. Previous to this work, the occurrence of a type of projectile point in association with the remains of mammals known for the Pleistocene period, and not known to have survived into the recent period, has given rise to the use of such terms as "Folsom man" and "Folsom culture," although it is difficult to see how a single, simple type of implement can serve as adequate criteria for determining a cultural manifestation. Roberts, however, reports materials, encountered *in situ* at an occupation site, which include not only points of the Folsom type, and channel flakes removed in their manufacture, but scrapers, bevel-edged tools, gravers, knives, blades, choppers, miscellaneous objects of chipped stone, workshop debris and food refuse in the form of bones. These paleolithic artifacts and rejects define a complex of traits of undoubted cultural significance; and the remains of *Stelabison occidentalis* and *Bison oliverhayi*, as well as the absence of mammal remains that could not be Pleistocene, serve to emphasize the question of a pre-Recent time for this Folsom complex.

Of this complex Roberts proceeds with commendable caution to say: "From a strict anthropological point of view it is still incorrect to speak of 'Folsom Culture' because the remains so designated probably should be considered only as one aspect of a basic, widespread early hunting pattern which may have extended across the eastern half of the continent."

The author reviews briefly the history of Folsom finds, and of later discoveries in New Mexico, Colorado, Nevada, Texas and Nebraska which tend to strengthen the argument for early man in America. His conclusion that: "Whether all of this evidence from the various places mentioned actually dates man in the closing days of the Pleistocene, indicates his presence at the beginning of the post-glacial period, or demonstrates a later survival of ice-age animals is a phase of the problem which the geologist and paleontologist must solve," should be obvious to all.

Following a concise statement of the geological features and problems of the site and their possible bearing upon the age of the deposit, the various artifacts encountered are described according to type, although a detailed typological study has been postponed until materials from further excavations at the site are made available.

A most interesting detailed discussion of the methods of stone chipping employed, as evidenced by the specimens themselves, goes a long way toward settling certain questions that have long been the subjects of controversy. The detailed chipping repeatedly present on one face of the channel flakes encountered rather positively demonstrates that Folsom points were definitely shaped before the long flakes were removed. Percussion, not mere pressure, appears to have been the means of producing the channels, as evidenced by the bulbs of percussion on the flakes and by the reverse impressions in the bases of some of the points.

Roberts, although differentiating between western and eastern subtypes, appears to share with certain other students the opinion that, wherever found, the Folsom-like type of point is in all probability importantly related, directly or somewhat distantly, to the cultural manifestation which has been called "Folsom." The reviewer fails to see why this type of point, which has a very wide distribution in North America, and which in basic pattern is very like certain slate points of the historic Eskimo, should necessarily have a closer relationship to the undoubtedly old Folsom complex than the single-flake knife, made and employed, among others, by the historic Sioux and Aztecs, has to the identical implement of Aurignacian manufacture. As the author himself points out, culture can not be determined by a single trait, and very old, simple implements are apt to survive as useful in very recent and relatively complex cultural manifestations.

W. C. McKern

Reports on Field Work by the Archaeological Survey of the Nebraska State Historical Society, May 1 to July 23, 1934. Waldo R. Wedel. (Nebraska History Magazine, Vol. 15, No. 3: 130–256, 1935.)

This report on field work in Nebraska and Kansas includes four separate articles by the same author. The first and largest of these defines and extends the range of that prehistoric and horticultural horizon known as the Upper Republican culture or aspect. This archaeological horizon was first pointed out by the reviewer (*An Introduction to Nebraska Archaeology*, Smithson. Misc. Collecs. Vol. 93, No. 10, 1935) but Wedel's paper contains a much more complete account, with additional data on both range and content. The Upper Republican aspect is believed to be the prehistoric horizon from which developed the Pawnee, and perhaps the Arikara and Wichita, cultures of historic times. The present paper demonstrates that it occurs in a somewhat variant and perhaps earlier form as far south as Ottawa County, Kansas.

Since they constitute the first truly scientific contributions to Kansas archaeology subsequent to the work of Udden, Williston and Martin, the two papers dealing with sites within that state are exceptionally important. With the tremendous prehistoric potentialities of the north central Plains just opening up, this excellent beginning toward tracing northern horticultural horizons toward their southeastern down river sources is very timely. The first of these

excavations, in Ottawa County, has already been mentioned. The second Kansas excavations were made at the important protohistoric village site on Paint Creek, in McPherson County, previously reported on by Udden. Wedel confirms and adds to the record of the original excavator. No remains of earth lodges could be found and Wedel concludes that grass or other perishable houses were probably in use. The ceramics, while bearing strong evidence of direct connection with protohistoric Pawnee wares in Nebraska, are unique and are said to be markedly dissimilar to Upper Republican type pottery. On the basis of a hurried examination of this material in Lincoln, the reviewer is inclined to regard the Paint Creek pottery as a close but very crude variant of protohistoric Pawnee wares in Nebraska (compare Wedel, Pl. XIV, with Strong op. cit., Pl. 3). Wedel, however, regards the cultural constituents of this site as representing a distinct aspect which he designates as the Smoky Hill-Great Bend.

This brings us to the final paper consisting of a "Preliminary Classification for Nebraska and Kansas Cultures." With the component, or individual cultural horizon within each site, as a basis, he builds up a taxonomic classification taking in all the known Nebraska-Kansas horizons. This is accompanied by an independent table showing the apparent time sequence of the various cultural units or aspects. Statistical verification of this preliminary taxonomic attempt is not attempted. The reviewer feels strongly that, whatever changes in this classification may be necessitated by statistical analysis and additional data, Wedel is on the only correct and scientifically tenable track in proceeding from the small unit (the component) to the larger whole (the basic culture).

The Nebraska State Historical Society, and its Director, Mr. A. T. Hill, are to be congratulated both on the highly important scientific results attained by their field party and on the excellence of their publication. The latter suffers somewhat from certain errors in the reproduction of plates which are reduced in size far below the actual space available. In general, however, the text is clear and the illustrations well chosen and adequate.

DUNCAN STRONG

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